# A COMPARATIVE STUDY OF THE NUTRITIONAL STATUS OF CHILDREN OF WORKING WOMEN- FACTORY BASED AND HOME BASED, IN THE CITY OF ALIGARH

## ABSTRACT

THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

**Doctor of Philosophy**

IN

**HOME SCIENCE**

BY

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FACULTY OF LIFE SCIENCES
ALIGARH MUSLIM UNIVERSITY
ALIGARH (INDIA)

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## ABSTRACT

This is a study on young children of working women from the low-income group. It was conducted in the city of Aligarh, which is 135 kms from Delhi. Aligarh is an industrial center for brass work.

Women form a large part of the labor force in many small scale and cottage industries. A majority of this labor force of the unorganized sector is "invisible". Their lack of visibility is that they are not counted as workers in any national statistics. They are not on the official rolls of any business concern even if they work in a factory, nor are the home-based piece rate workers counted as workers.

The work pattern of these working women is either factory based or home based. The women take up this work due to economic necessity, hence, their young children are the main beneficiaries or the victims of the mothers work pattern. The nutritional status of these under privileged children may be considered a good measure of the development of the country. The physical and consequently the mental quality of a large number of the future citizens of India should be central to all planning and policy formulation.

The focus of the present study was to assess and compare the nutritional status of the children of factory-based working and the children of home based working women and also to understand the various factors which influence their nutritional status. The particular cottage industry studied was the metal (brass) cap for bulbs industry. This industry is located mainly in Aligarh, Dehradun, Delhi, Meerut and Shikohabad. Women form the bulk of the unorganized labor in this sector. Local agents of the actual employers employ them indirectly. The women work on a piece rate basis. The periods, when work is available, are erratic especially in Aligarh, which is a communally sensitive area.

The women and their children constitute cheap labour for the employers without being provided any of the attendant rights and privileges. The workers were Muslim and Hindu. The sub contractors also belonged to te same communities but it was found that the workers were not selected because of their religious affiliations. Infact in most cases where the workers were Muslim the subcontractors were Hindus or even Christians. The lack of social interaction prevented the formation of workers unions.

The sample of the present study was purposively selected from four areas representing the different zones of Aligarh, Mushtaqnagar, Mahendranagar, Jeevangarh and Chandaniya

The exact universe of the women workers could not be pinpointed as most of the factory owners denied having women workers on their employee rolls. Home-based women workers constituted seventy per cent of the sample studied. The total number of the working mothers in the sample was 212 – 149 home based and 63 factory based. The number of children of these mothers, who fell into the age group of one-six years, was 320. Of these 213 were children of home based working women and 107 were children of factory based working women.

Three different kinds of questionnaires were constructed – one for the unit, one for the worker and one for the child. It was pretested on a sample of 32 children, 20 workers and 3 units. Relevant data on the physical and socio economic environment of the women workers and their children was collected.

The nutritional status of the children was determined by anthropometrical measurements of weight, height, sitting height, head circumference, chest circumference, mid upper arm circumference and calf circumference, which are

the most reliable. The reference standards used were the ones set by the Indian Council of Medical Research, the Indian Academy of Pediatrics and the National Center of Health Statistics.

The nutritional status of the children was assessed by the acknowledged classifications in use recently namely Gomez's, Jelliffe's, Indian Academy of Pediatrics and The National Center of Health Statistics USA. The nutritional status was assessed by age dependent and age independent classifications. This was specially done because the sample of children belonged to largely illiterate families and accurate ages could not be elicited.

The mother's work pattern was studied as also her nutritional awareness. Environmental factors both physical and social were also noted and observed. Information regarding availability of potable water, toilet facilities and community facilities like roads, drains, waste disposal, ventilation etc was also collected. Personal particulars like type of family, its composition, whether local or migrant, religion and husbands employment was also noted.

The findings were analyzed and interpreted accordingly – those that could be quantified were treated statistically while the others were qualitatively dealt with. The results of the study were as follows –

1. The 12-23 month age interval among both the groups studied had the maximum number of severely malnourished children.

2. The most severely malnourished children among factory based and home base women workers were girls.

3. The birth order of the malnourished girl children fell steeply after 4.

4. The heights and weights of almost all the children in both the groups were below the reference standards set by the Indian Council of Medical Research, the Indian Academy of Pediatrics and much below the internationally accepted standards set by the National Center of Health Statistics.

5. The mean Mid Upper Arm Circumference of the children of factory based women workers was better than the MUAC values of the children of the home based women workers.

6. The mean calf circumference values of the children of the factory based women workers was greater than the calf circumference values of the children of the home based women workers.

7. Head circumference values of boys from both groups were greater than the head circumference values of the girls.

8. Chest circumference values of the children of the factory based women workers were higher than the corresponding values of the home based group and at some age intervals were higher than the ICMR standards.

9. The chest head ratio of the children of factory based working women was not less than 1 at any age interval. The home based sample children had values less than 1 till the age of two years.

10. The Rao Index indicated that all the children were malnourished at the 12-23 month interval after which there was a slight improvement. At the 36-47 month interval all the children showed normal values.

11. The Kanavati Index showed that children of factory based working women were less malnourished than the children of the home based group.

12. The Quetlet's Index clearly depicted the fact that most of the children of home based women workers were in a state of gross malnutrition. The children of factory based working women were marginally better nutritionally.

13. According to Gomez's Classification, most of the boys in the factory-based group were in Grade 1 and Grade 2 of malnutrition. There were no boys who were severely malnourished. 20.4% of the girls were in Grade 3 while the majority were in Grade 2 and Grade 1. Among the children of the home-based working women, the percentage of boys who were normal was slightly higher but there were 11.2% in the severely malnourished Grade 3. The majority were in Grade 2. The percentage of girls in Grade 3 was 28.8% while 45% were in Grade 2 and 22% in Grade 1.

14. Assessment of nutritional status by Jelliffe's classification showed that most of the children of both the groups were in Grade 2 of malnutrition though the findings indicated that one-fifth of the girls were in Grade 4 and no boys were present in this category. In the home based group of children there were no children in the normal category till the last age interval. The majority of boys were in Grade 3 (36.20%) while the girls were in Grade 2 (32.98%). An equally large number of girls (28.88%) were classified in Grade 4. Boys had a much lower percentage in this grade.

15. According to the classification recommended by the Indian Academy of Paediatrics, a large percentage of children fell marginally into the normal

category 7especially after the age of 3 years in both the groups. Most of the boys in the factory based working women's group were in Grade 1 as also the girls. The only difference was that there were girls (16.32%) in Grade 4 while there were no boys in Grade 3 or Grade 4. Among the home based group, the boys and girls were mostly in Grade 1 and 2 although the percentage of boys in Grade 4 (5.17%) was slightly lesser than the percentage of girls (6.18%).

16. In the classification of the National Center of Health Statistics it was found that most of the boys were underweight and stunted (68.96%) in the factory-based group while only 61.22% girls were underweight and stunted. There were a lower percentage of boys who were stunted and wasted as compared to the girls (24.48%) in the wasted category there were 8.62% boys and 10.2% girls. 6.89% of the boys were in the normal category. IN the group of children of home based women workers 11.2% boys were under weight as compared to 12.37% girls, 43.96% boys were stunted as against 47.42% girls. 14.65% boys were wasted as compared to 12.37% girls and 23.27% boys were stunted and wasted while only 21.64% girls fell into this category.

17. There were significant differences in the Nutritional Status of the groups. The CFBWW were better than the CHBWW till the age of 3 years. Environmental factors – potable water, toilets, immunization have played a positive role.

18. The nutritional status of children of both the groups became noticeably better after 3 years of age.

19. The sample children of both groups showed that the majority had sparse dyspigmented hair and pale conjunctiva.

20. The diets of the children were mainly carbohydrate in content.

21. A higher percentage 57.11% of factory based working women's children were immunized as compared to 30.51% of children of home based women workers.

22. Most of the factory based women workers were locals of Aligarh while most of the home based workers were migrants.

23. The majority of the factory based working women were Hindus while the majority of the home based working women were Muslim.

24. Only 27% of the husbands in both the groups were employed on a regular basis.

25. Most of the home based and factory based workers lived in nuclear families.

26. The majority of women workers of both the groups earned Rs.500 or less a month.

27. The women workers of both the groups were mostly illiterate.

28. The majority of children of both groups were left in the care of older siblings.

29. A larger percentage (68.25%) of women from the factory based group had easier access to potable water as compared to 54.36% of the home based group.

30. 52.3% of the factory based working women had toilets in their homes as compared 37.59% of the home based working women.

31. The presence of the mother did not have a significant impact on the nutritional status of the child.

32. There is no significant difference in the nutritional status of the children of factory based working women and the children of home based working women after the age of 3 years.

33. After the age of 3 years, the nutritional status of the child depended more on the food availability in the family rather than on any other factor. Availability of potable water, toilet facilities and immunization played secondary roles.

The results suggest that the mother's work pattern influences the food availability in the family, which affects the nutritional status of the child. It has also been noticed that the gender and birth order of the child determine the food distribution within the family. This study will add to the body of information and will act as a guide to future researches in this area.

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**DEAN**

*Ref. No*.....

*Dated* 13.12.2000

This is certify that Mrs Elizabeth Thomas carried out the present work entitled " Acomparative study of the nutrition status of children of working women factory based and home based in the city of Aligarh." ~~work~~ as a Teacher candidate. The work is original and advancement over the existing knowledge in the area.

She is permitted to submit her thesis for the award of Ph.D degree in Home Science as a Teacher candidate.

Jameel A Khan

(Prof. Jameel A. Khan)
Dean

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I am indebted to the concerned authorities of all the libraries I consulted in Aligarh, Lucknow, New Delhi, Calcutta and specially the National Institute of Nutrition, Hyderabad for their willing assistance.

The working mothers and children of the sample studied deserve special thanks for allowing me to study their lives.

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E Thomas

(Elizabeth Thomas)

20 · 12 · 2000

## ABBREVIATIONS

| | |
|---|---|
| **CDC** | Center for Disease Control |
| **CFBWW** | Children of Factory Based Working Women. |
| **CHBWW** | Children of Home Based Working Women. |
| **CWDS** | Center for Women's Development Studies. |
| **GOBI** | Growth Monitoring Chart, Oral Rehydration Therapy , Breast Feeding, Immunization. |
| **HDI** | Human Development Indicators. |
| **HDR** | Human Development Report. |
| **HES** | Health Examination Surveys. |
| **HPI** | Human Poverty Index. |
| **IAP** | Indian Academy of Paediatrics. |
| **ICMR** | Indian Council of Medical Research. |
| **MUAC** | Mid Upper Arm Circumference. |
| **NCHS** | National Center of Health Statistics. |
| **NIN** | National Institute of Nutrition. |
| **NIPCCD** | National Institute of Public Cooperation and Child Development. |
| **NNMB** | National Nutrition Monitoring Bureau. |
| **PEM** | Protein Energy Malnutrition. |
| **SECWW** | Socio-Economic Conditions of Women Workers. |
| **WHO** | World Health Organization. |

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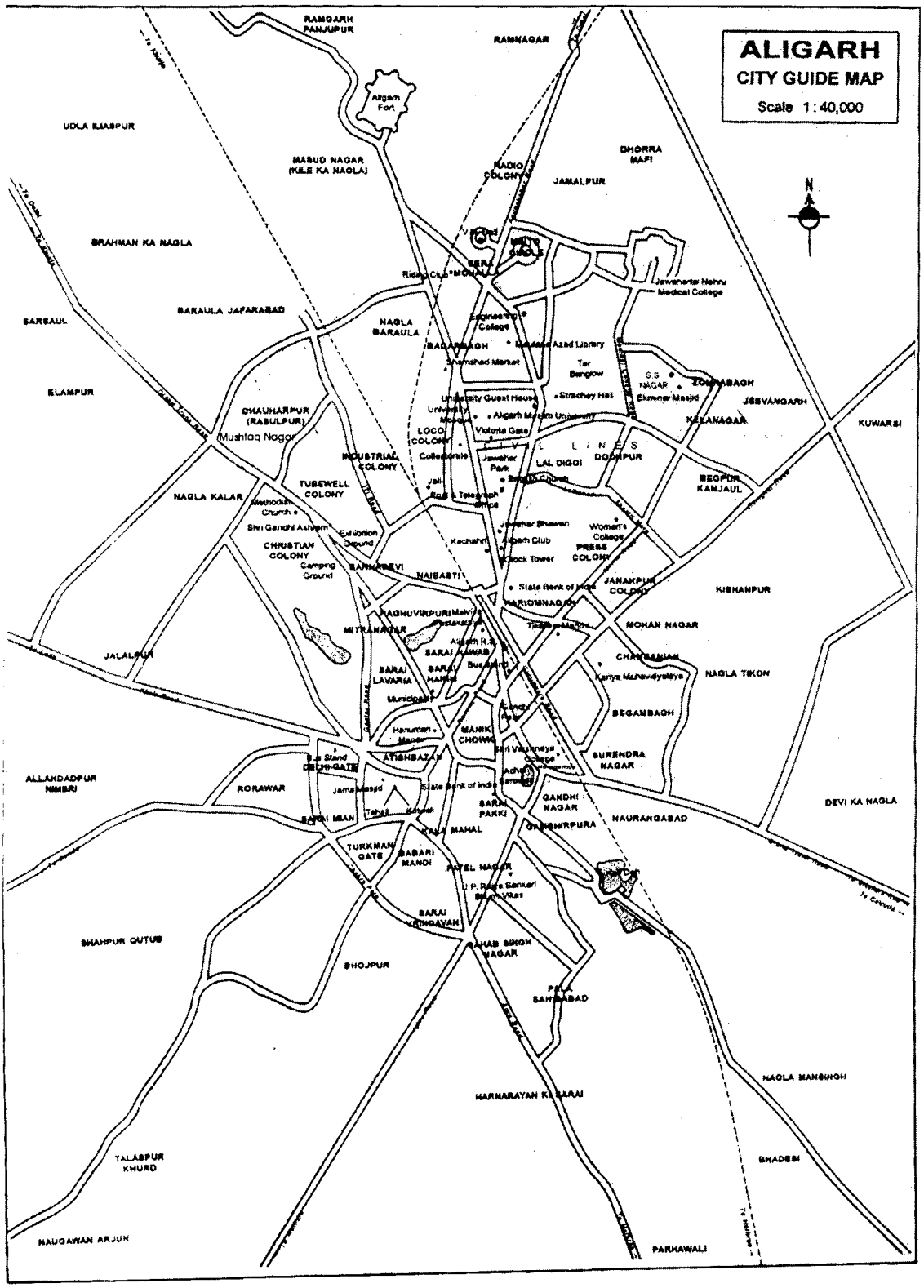
ALIGARH
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RAMGARH PANJUPUR
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CHRISTIAN COLONY
Camping Ground
Exhibition Ground
BANWARI DEVI
NAIBASTI
MITRANAGAR
JALALPUR
RAGHUVIRPURI
SARAI AWAN
SARAI LAWARIA
SARAI HARIA
Municipal
Hanuman Mandir
MANIK CHOWK
ATISHBAZAR
Bus Stand
DELHI GATE
ALLAHDADPUR NIMBRI
RORAWAR
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PATEL NAGAR
U.P. Rajya Sankari Bhandar Vikas
SARAI VRINDAVAN
SHAHPUR QUTUB
SHOJPUR
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Ekmmar Masjid
ZOOLA BAGH
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KELANAGAR
KUWARSI
Strachey Hall
University Guest House
University Medical
Aligarh Muslim University
Victoria Gate
LOCO COLONY
Collectorate
Jawahar Park
LAL DIGGI
D O O N P U R
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Telegraph Office
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"What is development if it is not to better the lives of people? And how can their lives be bettered if they do not as children, receive such basic necessities as proper nutrition, access to health services and potable drinking water and an education that will enable them to realize their full potential and make a constructive contribution to their societies?"

Kurt Waldheim
Secretary General
United Nations

May 1977

# CHAPTER 1

## INTRODUCTION

Children are a nation's most precious resource. The health and productivity of our society have roots in the quality of reproductive experience and the subsequent nurturing strategies of parents and childhood caretakers.

One half of the world's population lives in Asia and has to manage with less than one third of the total food resources, while Europe and America which have just one third of the world's population, have almost two-thirds of the total food supplies.

It is in the developing countries that the population has been increasing at a phenomenal pace. Fortunately India is one of the countries where the Green Revolution has been successful. The availability of food today is somewhat higher than what it was two decades ago, but the increased food production does not seem to have really improved the nutritional status of the vulnerable sections of our society. This is mainly because of a continued maldistribution of food.

As a result, malnutrition is a major public health problem in our country as it is in many other developing countries. This is in sharp contrast to the almost complete elimination of deficiency diseases in developed countries.

Malnutrition is a polite word for semi-starvation among children. It leads to disease conditions, protein deficiencies can bring about Kwashiorkor – a state where the child becomes swollen with edema, has sparse discolored hair and is generally irritable and apathetic. When Kwashiorkor is coupled with a calorie deficit, it results in Marasmus. The term Energy Protein Malnutrition (EPM) has now replaced PCM and PEM as recent thinking recognizes that energy rather than protein may be the most limiting nutrient but that both are involved. Deficiencies of other nutrients like vitamins and minerals can even cause blindness, skin problems, rickets, anemia, growth failure and diseases of the brain. The damage is sometimes incurable and permanent.

The causes of malnutrition among Indian children are complex and interrelated. Poverty undoubtedly is the main cause but dietary habits of the people ordered by customs and religious traditions also play an important role (Robinson 1970).

In urban areas, the problem of malnutrition is even more severe than in the villages. Unhygienic living conditions, lack of clean drinking water, environmental pollution and working mothers aggravate the problem. There is a general controversy whether women's participation in income generating activities outside the home is supportive of or is detrimental to the welfare of the young children.

The plight of children in India is in no way different from that of children in most developing countries of the world. For the majority of the children, even the basic amenities of safe drinking water and adequate nourishing food are out of reach (Report of the Surgeon General, 1988). A healthy child will grow into a healthy individual – a resource for the nation. Conversely, an unhealthy individual is a liability. It is because of this realization that countries all over the world are making tremendous efforts to bring about policy and environmental changes to help children attain their full potential. Yet, in India, these changes are still to bear fruition and much more needs to be done.

**Historical Perspective:**

India's commitment to children is framed in the Constitution Article 39 of the Directive Principles of State Policy that directs that children be " given opportunities and facilities to develop in a healthy manner and in conditions of freedom and dignity, and that childhood and youth are protected against exploitation and against moral and material abandonment".

In 1974, India reaffirmed it's constitutional obligations to the children in the National Policy for Children by declaring that "It shall be the policy of the state to provide adequate services to children both before and after birth and through the period of growth, to ensure their full physical, mental and social development. The state shall progressively

increase the scope of such services so that, within a reasonable time, all children in the country enjoy optimum conditions for their balanced growth".

Promises have been made by international communities to give every child a better future. There are 80 international law covenants and declarations regarding human rights of children. The United Nations General Assembly in 1959 adopted the declarations on the Rights of the Child. It stated that mankind owes to the child the best it has to give. There were ten principles, which formed the guidelines for the children's rights. In September 1990, the convention on the Rights of the Child drafted by the UN Commission on Human Rights came into force as an international law. The convention consists of 54 articles and is set of international standards and measures that intend to protect and promote the well being of children in society. Among others, the convention draws attention to the rights of children related to their survival, protection and development (Barooah, 1999). This includes the Right to Life, the highest attainable standard of health, nutrition and standards of living. The Right to Protection includes protection from exploitation, degrading treatment and neglect. The Right to Development covers support for early childhood development and care and social security. World leaders agreed on principle that the essential needs of children should be given high priority in the allocation of resources at all times and at all levels. All countries were to prepare their own National Plans of

Action to achieve their targets keeping in mind their specific situations, and available resources.

A detailed "National Plan of Action – A Commitment to the Child" was adopted in 1992 by the Government of India. The NPA has certain priority areas. They are health, nutrition, education, water, sanitation and environment. The state governments were instructed to frame their individual plans of action taking into account their specific needs and availability of resources. The NPA aims to improve the situation of children by the year 2000 A.D.

Existing laws, policies and constitutional provisions at the highest levels gives an impetus to the efforts being made to meet the basic needs of children. All programs for children are focused on the 0-14 year's age group (Universal Children's Day, 1994).

Article 24 of the CRC (Convention on the Rights of the Child) states that every child has the right to enjoy the highest attainable standard of health. The National Health Policy of 1983 stresses the launching of special programs for the improvement of maternal and child health. The government has set itself the goal of attaining 'Health for All' by 2000 A.D. through the provision of primary health care services. The health of women and children form the focus of most of these programs (Venkatachalam and Rebello,1983) .

A major child health goal of the NPA is to reduce the infant mortality rate to below 60. This would mean 100 percent immunization coverage, eradication of polio, elimination of neo natal tetanus, reduction of deaths due to measles, diarrhea and acute respiratory infections (ARI) by 2000 A.D. The major goal of the plan related to maternal health is reduction of Maternal Mortality Rate (MMR).

The MCH (Maternal and Child Health) program is a part of the primary health care service. Related programs are the UIP (Universal Immunization Programme) Oral Rehydration Therapy and Prophylactic schemes against nutritional anemia among pregnant women and against blindness due to vitamin A deficiency.

The development of health facilities and the use of package programmes for maternal and child health care has paid rich dividends. There is a gradual decline in the incidence of diseases and mortality rates IMR (Infant Mortality Rate) has declined from 146 per 1000 births in 1961 to 74 in 1993 and 72 in 1995. The maternal mortality rate is 420 deaths per 100000 births. This figure is from the National Family Health Survey conducted during 1992-93. The report however also states that there is no way to assess the completeness and accuracy of these estimates.

The nutrition of the child is clearly mentioned in Article 24 and Article 27 of the CRC. Among other requirements, the article states that "State parties shall take appropriate

measures: to combat disease and malnutrition including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate food and clean drinking water".

Though a lot has been done by the Government of India through nutrition intervention programmes to reduce the magnitude of malnutrition among children and women, there are still about 250 million people suffering from varying degrees of malnutrition (Bagchi, 1981).

One of the Nutrition Intervention programmes is the Integrated Child Development Services Program of the Department of Women and Child Development. It was launched in 1975 during the fifth plan period with 33 projects and had expanded to 3381 projects in 1994. The ICDS covers rural, urban and tribal areas.

The ICDS offers a package of services including supplementary nutrition, immunization, and health checkup and referral services to children below 6 years and also to expectant and nursing mothers. Nutrition and Health education to mothers is also important. The supplementary food distributed to children and pregnant women is expected to meet one third of their daily requirement of calories and proteins. 17.3 million children and 3.7 million expectant and nursing mothers receive supplementary nutrition. While evaluating the ICDS, NIPCCD has found that the programme

has brought about desirable changes in the nutritional status of the children.

Some other programmes of the Department of Women and Child Development and the Department of Family Welfare are the Special Nutrition Programme (SNP), Balwadi Nutrition Programme (BNP) and Mid Day Meals Programme for school children. The National Goitre Control Programme, The National Iodine Deficiency Disorders Control Programme and Anaemia Prevention and Control Programmes are some others run by the government.

In 1993, the National Nutrition Policy was adopted. The problem of malnutrition was tackled through nutrition intervention programmes for the vulnerable groups. The goals of the policy are in accordance with the objectives of the National Plan of Action. A National nutritional surveillance has also been set up. A databank on nutrition provides vital information on nutrition available in different sectors.

An analysis of the Indian Nutritional Status shows that the average calorie intake has increased. The consumption of proteins, fats and oils needs to be increased. The National Nutrition Monitoring Bureau (NNMB), 1990, states that only "9.9% children (1-5 years) are normal 43,8% suffer from moderate degree of PEM and 8.7% from extreme form of malnutrition.

Article 24 of CRC also recognizes the child's right to clean drinking water and environmental sanitation. Safe drinking water is a basic necessity for survival. Children being most vulnerable are more susceptible to water borne infections and diseases like diarrhea, cholera, typhoid, dysentery and worm infestations. Chemical and biological contamination of the available water supply affects children the most and results in physiological disorders.

The National Drinking Water Mission (NDWM) has been functioning since 1986. Its aim is to implement the various water programmes and integrate them with other rural development programmes. The NDMM has been renamed after the former Prime Minister Rajiv Gandhi and is now known as the RGNDWM. Its norms for water are 40 lt/day per capita. Sanitary means of excreta disposal are also emphasized in the NPAC.

Article 18 of the convention stresses on the availability of childcare services. All appropriate measures should be taken to ensure that children of working parents have the right to benefit from child care services and facilities for which they are eligible. Some programmes, which are directly related to this article, are Day care centers for children of ailing mothers. This is mainly for children up to 5 years of age of migrant, agricultural and construction laborers whose monthly income does not exceed Rs.1,800 per month. The services include supplementary nutrition, health check up, immunization etc. The Department of Women and Child

Development has set up a National Crèche Fund. The World Bank has provided credit for it. The fund helps to set up new crèches and anganwadi cum crèches as and when required.

Besides these governmental agencies, a number of NGO's (Non Governmental Organizations) are working for the welfare of children. They endorse the present WHO/UNICEF concept of primary health care. They accept as a fundamental starting point that health care for the preservation and promotion of health is one of the most basic human rights as declared in the Universal Declaration of Human Rights (Report of the UNICEF, 1998). NGO's have a long history of active involvement in the promotion of human well being. They possess certain strengths and characteristics, which enable them to function as effective and dynamic agents in this process. They have exhibited a special capacity to work within the community in response to expressed needs. They provide important links between the community and the government. NGO's support the view that the promotion of primary health care must be closely tied to a concern for total human development. The totality of human development encompasses the physical, mental and social and spiritual well being of an individual. Primary health care must be an integral part of the overall development of society. Human development cannot be fragmented. Social and economic factors are closely interrelated and interdependent. Health and nutrition education are of no use if food production is inadequate and food distribution is faulty. Provision of a source of clean

water to a community will have an impact on water borne diseases only insofar as the community is educated in its use and management (Report of the UNICEF, 2000).

In the early seventies there emerged an institution for day care for the children of the working mothers of the lower income groups. The plight of the children of the migrant Rajasthani laborers struck a chord and Mahadevan (1977) responded by establishing a "simple shelter under a tent". It meant looking after the babies, non-formal education of the school and engineering low cost thought provoking activities for the children. At night adult education classes were also held for those who were interested in improving their lot.

These Mobile Crèches function mainly in the metropolitan cities like Delhi, Mumbai and Pune. More than 2 lakh children have already benefited from this scheme. As is stated in the National Nutrition Policy, 1993, the condition and nutritional status of the children in India especially among the lower income groups cannot improve unless the approach is holistic. Children cannot be viewed in isolation. When very young they are like an appendage of their mothers and their physical and social health is totally dependent on the mothers or caretakers as also their physical and social environment.

Most women in the lower economic strata have to take up some sort of remunerative work due to dire economic necessity. This work is either within the four walls of their

home or outside in fields or factories. Their work pattern consequently plays an important role in the health of their children. Sometimes the very survival of the family is dependent on the woman's income.

The decade 1975-85 was declared as the International Decade for the Women by the United Nations. 140 nations made a commitment to strive for women's development, as they constituted half the human race. It was more or less during that time that academic literature moved away from studying women's role in the family to her role in society and her workplace. There has always been a multidisciplinary approach to women's development though her economic behavior has been central to most studies.

The Indian Constitution guarantees equality of opportunities in employment matters and it directs the state to secure equal rights to "adequate means of livelihood, equal pay for equal work, and just and human conditions of work".

Industrialization and consequently mechanization has excluded large numbers of women from active participation in the productive process. The majority of those who participate are just about tolerated, not treated equally and the conditions of work leave much to be desired. Women workers are subjected to exploitation of various kinds with no easy avenues for protection.

All women's organizations are becoming more vocal, legislations and public awareness has initiated actions favoring women. This has made a perceptible dent in the organized sector but in the unorganized sector it has gone unnoticed. Women in the organized sector form only 6% of the total number of women workers. 94% of the women working in India belong to the unorganized sector (See Appendices).

This sector which employs a large portion of the female workforce covers marginal workers as well as workers living on the borderline of starvation. There are a lot of activities that are being diverted to this sector because of the nature of the employment. As a consequence, these poor women will gradually be relegated to the background, their jobs will continue to be low paid and their share in the products of development will decline. It is a vicious circle. There are several factors that have hampered women's integration into the development process of the country. The lack of a well-defined policy indicating areas where the women need special protection and assistance leaves them without access to knowledge, skills and employment.

Another aspect is that there seems to be some preconceived notions regarding the efficiency of women workers. Employers feel that women cannot be employed on a regular basis as they take frequent leaves of absence; they cannot be taught skills and thus will affect the productivity. This results in wage discrimination.

Some of the reasons why women are found in the unorganized sector are because basically they are immobile. They do not move independently for a better paying job leaving their families behind. This is the reason that forces them to accept low paying jobs. Another reason is that the age group 15-40 years is the age of the larger part of the female workforce. This also happens to coincide with the reproductive age of women in India. Thus, during the period they will take time off for child bearing and child rearing. It is also possible that these roles will interfere with their ability to learn new skills that would improve their earning capacity. Illiteracy proves the backbreaking blow.

Kumari (1989), in her article, says that the introduction of new crops, new technologies, increasing modernization of agriculture, increasing landlessness and sub division of land has affected job opportunities for women. She also goes on to state that most of the women in the unorganized sector are unaware of the concept of a trade union. They never fight for equal wages and are unaware of welfare measures. What they never had, they never miss, and even in the home situation they are content with leftovers. The consciousness of being considered equal does not exist. They are content with what they have.

In the National Perspective Plan for Women, 1988-2000, the core group in its report, states that one of the major reasons for women's work becoming increasingly limited to the unorganized sector is that women lack the opportunity to

acquire skills and training which could improve their job prospects. This is related to the prevailing social relations between men and women. Women have to bear the burden of the domestic chores, which, in a poor household is time consuming and labour intensive and hence they do not have the time and opportunity to acquire skills and training for better jobs. This in turn leads to their being relegated to jobs that are labour intensive, time consuming and low paid.

Jobs in the unorganized sector are characterized by low pay, long hours of work, low productivity, low skills and lack of job security. There are few labor or trade unions to facilitate the mobilization of women workers and knit them into a conscious workforce. The nature of occupation in this sector is varied and it cannot be easily categorized. There is inadequate legislation and the law enforcement agencies are ineffective, particularly in regulating their work conditions.

Accurate data on the extent and nature of women's work is an essential pre-requisite in the development of employment policies and programmes (NPPFW, 1988). Data relating to the employment of women in India is currently available from six major sources. There are

(1) The Decennial Population Census
(2) Surveys undertaken by the National Sample Survey Organization
(3) Studies conducted by the Directorate General of Employment Training and Labour Bureau

(4) Annual Surveys of Industries compiled by the Central Statistical Office
(5) Periodical reports from the State Governments
(6) Individual studies conducted by the central and state governments, universities and research organizations.

In most of South and South East Asia, the female working poor find themselves at the bottom of the three hierarchies of gender, class and ethnicity or caste. The interaction of class exploitation, patriarchal domination, ethnic oppression and discrimination constitutes the core of their chronic disadvantages.

Employees fit into a two-tier labour market. The upper tier consists of those employed in the organized private and public sectors on a more or less regular basis at wages or salaries adjusted with changes in the cost of living. The lower tier covers the vast sections of agricultural labor, coolie and construction labor of all kinds, all kinds of service workers hired on a casual basis without job security and worker benefits and at wages which are below the legal minimum.

The number of workers in the more crowded lower tier – the informal and unorganized sector – has been expanding much more than the upper tier. Female concentration in the ultra exploited lower tier is not only pronounced in most of the South and South East Asian countries but has increased

over time. A large part of the growing mass of female working poor consists of low wage casual laborers. More than 90% of the female workforce in India belongs to the unorganized sector (Bardhan, 1989).

Women are socially conditioned in such a way that they undermine their own status as workers. The underestimation and underreporting of work done by women is especially true of states in North India (Raju, 2000). Housework like cooking, washing, fetching water, collection of fuel and fodder, tending livestock and the major role of child bearing and rearing accords the woman the status of a non-worker. Any home based economically productive work is also not graded as work in any national statistics.

The status of women in a society is a significant reflection of the level of social justice in that society. It usually involves a complex set of interrelated factors. The woman's status is often described in terms of her level of income, employment, education, health and fertility, as well as the roles she plays within the family, the community and society. The work, which a woman does – agricultural, industry or home based, her contribution to family income and her role within the family as wife and mother, is unquestionably significant.

It is only recently that there has been increased political and public attention to the burdens placed on women by their multiple roles. Social pressures still push a woman to let her reproductive role subsume her productive one. While there

have been some studies of the ways in which women cope with their manifold roles, these have been mostly concentrated in the organized sector and have often originated in other countries.

In India, where the overwhelming majority of the female workforce is in the unorganized sector, schemes for income generation for women can help to break the barrier of poverty. Due recognition and appreciation of their multiple roles and how the women handle them is necessary.

Childcare has traditionally been exclusively the woman's responsibility and hence the manner in which the woman balances her income generating work and childcare roles is of special significance. In 1989, the Shramshakti report of the National Commission on Women in the informal sector, stressed on the urgent need to make visible this large section of "invisible" workers and protecting them legally (Bhatt, 1988).

The young children of these workers would as a consequence be the main beneficiaries. The report goes on to state that the entire earnings of these women are spent on the upbringing of the children and betterment of the family members.

Open unemployment is rare in India, particularly among women. Most poor people cannot afford to be idle. They

work but their work is underemployment in low visibility and low productive unorganized sectors.

For the purpose of the present study the following terms have been defined –

***Work*** – economically gainful activity

***Factory based Work*** – any income generating activity in a factory

***Home based Work*** – any income generating activity in the home

***Working Woman*** – a woman working in a factory

***Non-working woman*** – a woman who is not involved in any income generating activity outside the home

***Childcare*** – the activities carried out by the biological mother or a mother substitute addressing the developmental needs of the child.

***Caretaker*** – is any person who attends to the developmental needs of the child for a considerable period of time per day.

***Working mother of young children*** – is a mother having at least one child below 6 years of age and involved in an income generating activity for at least 6 hours per day.

***Unorganized Sector*** – comprises of all the occupational categories not included the public sector and not covered by statutory provisions in the private sector.

This study was based in Aligarh, a city in Uttar Pradesh. This large North Indian state is characterized by exceptionally high levels of mortality, fertility, illiteracy, under nutrition, social inequality and a slow pace of poverty decline (Dreze and Gazdar, 1999). A large part of India's total population lives in Uttar Pradesh – 139 million at the time of the 1991 census.

According to the Human Development Report (1994), female life expectancy is below 55 years and the under 5-mortality rate is as high as 141 per thousand, not very different from sub Saharan Africa. The U5MR is the highest among all the major Indian states ( HDR in Report of UNICEF, 1995).

According to the recent National Family Health Survey, Uttar Pradesh comes second to Bihar in terms of the incidence of under nutrition among children below the age of 5. Another area in which UP seems to fare worse than most is that of gender equality – the female male ratio is as low as 879 per thousand. This ratio is even lower in western UP (0.84). Aligarh is a city in Western UP.

The present study is an attempt to assess and compare the nutritional status of the young children (1-6 years), the most vulnerable section of an already economically deprived group of working and non-working women. Some significant factors – the physical and social environment – associated with malnutrition have also been identified.

**General Objective:**

To assess the nutritional status of children of working women of the lower socio economic groups.

Specific Objectives:

1. To assess the nutritional status of children (1-6 years) of working and non-working women through anthropometry taking into account their gender.

2. To understand and compare the interrelationship between the mother's economically productive work patterns – home based or factory based, and the child's health status.

3. To study the effect of the physical environment, type of family and family income, on the health status of the child.

4. To identify the effects of the caretakers other than the mother, on the nutritional status of the child.

## Chapter 2

## REVIEW OF RELATED LITERATURE

There is an urgent need to make certain that the most vulnerable sections of a community both physiologically and economically, are located and cared for. Undoubtedly, young children especially in the 0-6 years age group, merit absolute priority in any nation's nutrition policy.

The formation and implementation of The National Nutrition Policy must rest on sound scientific data. Hence it becomes imperative for policy makers to be fully informed of the current nutritional status of populations in different regions of the country and of the possible factors contributing to malnutrition among them. The nutritional status of the population or community is one way to assess its development. It is also a Human Development Indicator.

The causes of malnutrition in children have become increasingly complex and multifactorial with the passage of time. Writers in the context of the causes of malnutrition have used the concept of a 'web'. Many studies have been conducted in different parts of the world to determine and understand the different factors, which influence the nutritional status of the children in each community. These types of studies are essential as they will help to formulate policies by which nutritional imbalances may be corrected and consequently ensure a healthier and more economically productive nation. Some of the factors reviewed, which

affect the nutritional status of the children in this study are related to the child, the mother, the socio economic level of the family and the physical environment.

A – **Factors related to the child-**

- Age
- Sex
- Birth Order
- Anthropometry
- Clinical symptoms and Nutritional intake

B – **Factors related to the Mother-**

- Mother's employment and work pattern
- Nutritional awareness

C – **Other Factors-**

- Environmental factors
- Family income
- Caretakers other than the mother.

## Factors related to the child

**Age: -**

The nutritional status of a population is critical to the development and well being of a nation. In most of the developing countries there is widespread poverty mainly due

to under nutrition – a condition largely prevalent among young children and women. Malnutrition and under nutrition result due to imbalanced and inadequate food intake. In children it leads to stunted development and growth faltering, nutrition related diseases and infections (NNP, 1993), the most critical age interval for nutritional risk has shifted from school age to pre-school age and later narrowed to infancy and early childhood i.e. 0-4 years (Ghassemi and Teply, 1983) Infancy and early childhood are the periods when malnutrition is most marked (Jelliffe, 1968). The physical growth and mental development of pre school children attain a high degree of importance with regard to nutrition. They are the most vulnerable segment of a nation's population (Reddy, 1977; Haxton, 1984).

In a study conducted in the Medak district of Andhra Pradesh by Devi and Geervani (1998), to understand the factors that contribute to maintenance of normal growth and nutritional status in pre-school children of socially and economically deprived communities; it was found that 73.7% of severely malnourished children were in the age group of 13-36 months. This is usually the period immediately following weaning. Several investigators have reported that the proportion of the severely malnourished children under two years of age is nearly four times greater than the proportion of five years olds so characterized (Ballweg, 1972). This is in agreement with the findings by Rajaram et al, 1990. An analysis of the age specific death rate of children in India during the 1981 period show that 41% of

the deaths occurred in the age group 0-4 years and severe malnutrition was one of the main causes.

Repeated illness coupled with malnutrition result in stunted growth and it is feared that such children may not be able to achieve their full intellectual potential (Ramamurthy, 1986). The status of the child in India is unsatisfactory. There are millions of children suffering from malnutrition and infections. This results in stunted physical and mental growth (Paul, 1990; Statistics of Children in India, 1997).

During the pre-school period there is an excessive demand for nutrients, especially of protein, than that of older children and adults (Srivastava, 1979). This view is emphasized by the UNICEF (1990) – a child less than three years of age needs feeding twice as often as an adult with smaller amounts of more energy rich foods. This may always not be practical for mothers who work outside the home. A katori of watery Dalia is more likely to fill the child's stomach, and take away its hunger without meeting its proportionately greater energy needs. Earlier the date of the NNMB, (1975-1979) showed that among pre-school children stunting increased with age but the picture has somewhat altered. The National Nutrition Monitoring Board of the National Institute of Nutrition, 1997, reports that the percentage of children with severe under nutrition decreased from 15 to 9 in the age group 1-5 years.

**Sex: -**

Like all traditional societies, Indian society shows a distinct preference for the male child. The birth of a son is greeted with much pomp and gaiety while that of a daughter with quiet sorrow. This reinforces the observation of Minturn and Hitchcock, 1966 – the birth of a boy usually heralded gay festivities while girls were given a more subdued reception, if given one at all. Moreover, a son was more likely to get the better food, clothes and care (Mandelbaum, 1970).

Among the lower socioeconomic levels the yearning for sons is often based on the hope that they will prove insurance for the parent's future. Daughters are 'Paraya Dhan', and it is foolish to invest in them – a mere wasteful expenditure. As a consequence, the girl child is relegated to the background.

If there is one cultural trait that cuts across barriers of religion, region and caste, it is this devaluation of the girl child (Anadalakshmy, 1994). Among certain communities – the preference for boys may be due to the fact that sons are needed to perform religious ceremonies and rites of their fathers and other ancestors (Mayer, 1960).

India is one of the few countries where the gender ratio is tipped against women. IN 1991 it was 927 per 1000 men. The main reason for this declining sex ratio is the high mortality rate among females in all age groups. Malnutrition, under nutrition and a limited access to health care are the main causes of female mortality (Tandon & Sudershan,

1998). Girls from infancy to adulthood are the worst victims of malnutrition as a result of social discrimination. A World Bank Report on Women's Health Status in India, 1996, stresses the fact that being girls they get less vaccination, less education and less nutrition than their brothers. As a result when they grow up, they are less healthy than the boys and so fall easy prey to infections and disease and as mothers, produce weak and sickly babies.

It is heartening to note that the discrimination against the girl child is very gradually changing. Bhuiya et al (1986) reported that there was little difference in the nutritional status among boys and girls at the lowest socioeconomic levels. The latest NNMB report (1997) states that there has been a decrease in the proportion of moderate and severe malnourished children, irrespective of sex, among pre-school children.

**Birth Order: -**

A factor, which may influence the nutritional status of the young child, is its birth order in the family. The higher the birth order, the larger is the number of children present in the family. It means that an extra portion of the already scant resources will have to be shared.

National or community availability of nutrients may not represent adequate family or individual nutrient intake (Chen, 1983). The distribution of food within families is that

the men and the boys are served first. Women and girls make do with the leftovers.

A high incidence of malnutrition was present in children with birth order more than 4 (Gopalan and Rao, 1969). Devi and Geervani (1998) have endorsed this view. Their study states that the birth order of the child was found to be positively and significantly associated with underweight as well as the wasting of children. Definite but not significant positive association was found between birth order of child and stunting.

Another study on pre-schoolers conducted in Punjab by Cowan and Dhanoa (1983) found that 52% of all the children with severe malnutrition were 'unwanted' females, either the second female where there was no son, or a female of a family of four or more children.

In an action research study on the girl child (Anandalakshmy, 1994) the first-born daughter had an edge over girls born later, in access to schooling. Birth order data of this kind clearly shows that poverty compounds the gender discrimination in the family. 85% of the entire sample of the action research study falls into the first two birth orders. The fourth order comprised only 3.3%. This finding is open to interpretation.

Wray and Aguirre (1969) found that the nutritional status of the first five children in the family is significantly higher than that of the sixth and the higher birth order siblings. In some

other studies, (Desai et al, 1999) the birth order of the child did not seem to have any association with malnutrition. This view is strengthened in a study in Thailand (Charoen yooth, 1990) on the nutritional status of pre-school children. It was found that as the birth order of the child increases his nutritional status improves.

**Anthropometry: -**

Considerable research points out that nutrition and healthy growth are the outcome of three essential factors – accessibility of food in the home, health care and child caring practices. There are three commonly used measures of malnutrition among children under five years of age. Stunting which measures a child's height against that expected for the average child of the same age. Wasting which measures the child's weight against that expected of the average child of the same height and Underweight, which measures the child's weight against that, expected of the average child of that age (UNICEF, 1995).

Nutrition influences growth and development before as well as after birth. Even at birth, one in every three children born in India is of low birth weight. The rate of malnutrition among Indian children below five years of age is more than double the average for Sub Saharan Africa.

The daily diet of the child, even if it is deficient by only 200 – 300 calories, can result in growth retardation. This is a

sure indicator of malnutrition. Gopalan and Chatterjee (1985) note that growth retardation is an important quantifiable manifestation of under nutrition. When the diet is modified the child begins to grow in height and weight. Growth rate is maximum during fetal life, the first year and at puberty. Growth is slower at other periods. In a study by Chaudhuri (1975) the anthropometric observations of boys are much more than that of girls during the pre-school years. Most of the children had body weights below the Harvard standards. The head and chest circumference of the girls was lower than those of the boys, but the head circumference of both the boys and the girls was the same as the ICMR figures. The arm circumference was lower than the international standards. In another study (Bakshi and Bhandari, 1977) though boys were heavier than girls both were below the ICMR values. After the age of two years girls had higher arm circumference.

In a study by Srivastava (1991) it was observed that boys were heavier than girls. It was also seen that the children were lighter in weight as compared to ICMR and Harvard standards.

Weight is an important index of the physical growth and development. The birth weight of infant of a well-fed Indian mother is about 3.2 kg. Birth weight doubles by the fifth month and trebles by the end of the first year. By the end of the second year the weight of the child is approximately four times its birth weight. After the second year there is a

steady increase of 2.25 to 2.75 kg a year till the adolescent spurt occurs (Park and Park, 1991). Weight is affected within a short duration of inadequate nutrient intake and ill health. Height is a measure of the linear growth of the body. It does not change as rapidly as weight. Therefore weight can be considered a more accurate index of nutritional status. Any acute nutritional deprivation is reflected in weight loss whereas a lack of height is indicative of chronic nutritional deficiency. Another study (Guthrie, 1979) states that weight for height is an excellent indicator of recent nutritional stress while height for age is more indicative of long-term nutritional inadequacy.

The measurement of the circumference of the middle upper arm (MUAC) proves to be a useful and practical means of assessing protein calorie deficiency of early childhood. This measurement is independent of age, and is particularly useful in the nutritional assessment of populations in rural areas where no exact birth records are noted. Jelliffe, 1983, has made a similar observation. When age is difficult to estimate or know, the weight for height and arm circumference provides age independent measure. The head circumference is related to the brain size and to a small extent to the thickness of the tissues and the skull. Brain size increases rapidly during the first year when the head circumference reflects age rather than health or nutrition. However in the second year of life, the brain size can vary with the nutritional status in protein calorie malnutrition. In nutritional anthropometry, the chest/head circumference

ratio is of value in detecting protein calorie malnutrition in early childhood (Swaminathan, 1993). The use of the chest circumference is mainly in the second and third year. At one year of age, the head and chest circumference are nearly the same for the healthy child, after which the chest grows more rapidly. Between the ages of one and five years, the chest/head circumference ratio of less than one may be an indicator of protein calorie malnutrition (Swaminathan, 1993).

In general, the weight, height and arm circumference have come to be considered as the most sensitive parameters of nutritional status of children under 5 years and most practical for the monitoring of individual children or of a population of children (Gopalan and Chatterjee, 1985).

Rao et al (1979) states that weight and height measures are adequate for assessing the nutritional status and very little is obtained by other forms of measurement.

The nutritional status can also be ascertained by other methods like biochemical tests, dietary intake and utilization and clinical manifestations – but these methods have their limitations. Growth assessed by anthropometric measures is one of the most sensitive indicators of the nutritional status of a child (Devi and Geervani, 1998).

**Clinical Symptoms and Nutrient Intake: -**

According to Guthrie (1979) clinical observations and symptoms are the least sensitive approach to assess nutritional status. This may be due to the fact that some clinical symptoms observed in malnourished populations have no relation to the dietary deficiencies (Swaminathan, 1993).

Malnourished individuals usually show symptoms due to multiple deficiencies in the diet. Some symptoms may be common in several deficiency states. The lack of reliability may also be due to a certain bias of the observer. This could be a possible source of error in clinical observations (Bose, 1986).

Clinical observations involve an assessment of the health of those parts of the body that can be readily observed in a routine physical examination. This method is particularly suited to rural and illiterate populations, which might object to the taking of blood, urine and tissue samples.

The most commonly observed tissues are the eyes, mucous membranes, skin, hair, nails, mouth, tongue, teeth, gums, thyroid glands and the skeletal system. Clinical symptoms are widely used to confirm biochemical and dietary data. In an all India study conducted by Ramamurthy (1986) evaluating Balwadi Nutrition programme, it was observed that conjunctival xerosis and night blindness were common

among the non-beneficiary groups. Pale conjunctiva was associated with anemia. The earliest manifestation of Vitamin A deficiency is night blindness, conjunctival xerosis, Bitot's spots and xerophthalmia. The serious form of xeropthalmia is most frequently seen in young children especially between 1 and 5 years of age. It occurs very frequently in association with protein energy malnutrition and is closely associated with poverty. The problem of xeropthalmia seems to be most marked in Asia with high rates in India, Pakistan, Bangladesh and the Philippines (Latham, 1983).

Anemia may be suspected if the mucous membranes specially the ones on the under sides of the eyelids are pale. The condition of the skin is often a reflection of the nutritional status of the child. A normal healthy child has a soft clear and glowing skin. Dermatitis, which occurs on the arm, chest, back and thighs, is due to as lack of Vitamin A, fatty acids and B complex vitamins. Angular stomatitis is indicative of riboflavin deficiency in the diet.

It is estimated that 40-60% of pre school children are anemic (NIPCCD, 1984). This view is supported by the evaluation of the BNP programmes (Ramamurthy, 1986) Finding: Clinical examination of children revealed symptoms of protein energy malnutrition such as dull, thin, dyspigmented hair, potbelly, apathy and edema. These symptoms were more prevalent among the non-beneficiary children.

In health projects carried out in Tamil Nadu (Gariyali, 1990) it was realized that most of the problems of malnutrition were not solely due to poverty but also due to ignorance. Vitamin A solutions and ORS packets were distributed and health workers were trained to identify nutritional defects.

The food both in quality and quantity, which a child consumes, practices associated with feeding, and food hygiene in general, directly influence the growth of the child. A child's nutrient intake is determined by the diet of the mother and the child (Begum, 1989). The mother's food intake during pregnancy and her nutritional reserves affect fetal nutrition. In most rural areas of developing countries, breast-feeding is universal during the first and the second years of life. Unfortunately breast-feeding may be declining in many urban and periurban settings (Chen, 1983). Various studies indicate that breast fed infants have a much lower incidence of morbidity and mortality than those given animal milk (Wray and Aguirre, 1969) children fed on breast milk are less likely to be malnourished and have better weight and height than bottle fed infants (Rafiqal, 1984). The time of introduction of solid food to breast fed children is an essential factor in determining nutritional status. (Devi and Geervani, 1998) also found negative association with the age of introduction of solid food on the weight of the child. This finding was similar to that of Grewal et al (1973) study in Madhya Pradesh. In families where semi solids and adult diets are started 3-6 months later than for normal children

there are more chances of their developing moderate and severe malnutrition (UNICEF, 1977).

In studies on pre school children conducted by the ICMR Gopalan et al (1984) found that in general prolonged breast-feeding was the rule in all the regions. Between the ages of 1 and 2 years, more rural children than urban children were found to exist exclusively on breast milk. The children were usually weaned after the age of two years. Milk and/or cereals formed the main staple fed to the children. Traditions and customs were found to determine the choice of food supplements.

This view is supported by (Kurup, 1983) who states that children are given solid food only after they have been given rice under the religious rituals – the suitable time suggested by the astrologers or religious priests.

The ICMR studies (1984) also found that the diets of children in all the regions were predominantly cereal based and much below the recommended dietary allowances. There was a widely held belief among mothers of the lower socioeconomic group that as long as the child was breast fed, it did not need any supplementary foods. This is in accordance with one of the findings of an action research study, (Anandalakshmy, 1994) sponsored by the Department of Women and Child Development. Almost 24% of the sample mothers introduced milk supplements before the first year of the child while about 45% of them did so after the

first year. About 29% said that they never supplemented breast milk (Ramachandrudu, 1997).

According to the UNICEF report (1999) stunting is a critical indicator of child malnutrition. Malnutrition is the cause of more than half of all child deaths in developing countries. Long-term reduction in dietary intake and repeated episodes of illness cause stunting and these are most damaging in the first two years of life. The report goes on to state that stunted children may also suffer reduced cognitive development and hearing ability. Stunting is also associated with diminished work capacity and increased risk of degenerative diseases in adulthood (Desai et al, 1979).

In most developing countries there is evidence of calorie deficiency in the diets of pre schoolers particularly those below three years (Gopalan et al 1969, Ghai et al 1970, NNMB report 1997) Data on intra-family dietary distribution shows that a higher proportion of preschool children get less than their physiological needs as compared to adults, a finding commonly observed in all the states (Tomar and Srivastav, 1980).

The report of the National Nutrition Monitoring Bureau (1997) has consistently confirmed in successive surveys that the primary bottleneck in the diets of the lowest segments of Indian society is energy and not protein. A study conducted in Bangladesh by Hasan and Ahmad (1984) demonstrated

that it is the level of energy intake that limits the growth of pre school children.

## Factors related to the Mother

The health and nutritional status of the children is an outcome of several factors associated with the mother – age, literacy, occupation, time available for child rearing, nutritional awareness of the mother etc. There are a large number of studies on each of these factors. The following have been dealt with in the present study.

**Women's employment and work pattern: –**

Poor women are not a homogeneous group. They are divided on grounds like caste, class and employment activity. What they have in common is deprivation and discrimination. They have poorer access to development opportunities. They are discriminated against in the family itself, in terms of distribution of income, consumption and assets (Bhatt, 1988; Devi, 1982). Female workers are paid fewer wages irrespective of their qualifications and their working hours. Household responsibilities, illiteracy, lack of technical skills coupled with the traditional outlook of society towards female employment; restrict their mobility, which results in acceptance of work even at low wages (Joekes, 1987; Bhoite, 1987). Moreover, female earning is considered supplementary to male earning (Tripathi 1992, Singh 1989, Bhatt 1988, Singh and Singh 1992). The women's personal

contribution gets merged with the family and becomes invisible. The reality is that women's income is used for the survival needs of the family. Children in these families suffer the effects of poverty, malnutrition, and unhygienic conditions of living, lack of opportunities for education. They also suffer from neglect and lack of proper time and attention from their mothers or surrogate caretakers (Banerjee, 1989).

The allocation of the mother's time between income generating activities and work within the household has important impact on the health and nutritional status of the child (Gerson, 1985). In a study by Devi and Geervani (1998), one of the findings was that the occupation of the mother was a significant factor influencing the wasting of the child though not stunting. Wray and Aguirre (1969) on the other hand in a study in Candelaria in Colombia found that the nutritional status of the children of mothers who worked full time was better than those who worked part time. They were able to make better arrangements for the care of their children.

**Home based work: –**

This kind of work plays an important role in both a family's and the nation's economy. This term is usually used for the large number of piece rate women workers who work in their own houses or in a more affluent neighbor's home nearby. Home based workers are invisible to society literally, in that

they work within their homes; and officially, in that they do not appear in the Census or other official statistics. This productive activity is largely the preserve of women. It tends to remain invisible and is generally ignored by legislators and planners. Moreover, as they are isolated in their homes, these home-based workers are extremely vulnerable to exploitation.

Piece rate home based workers generally combine their household tasks with income generating work. The hours of work vary from 4 to 5 hours to an overextended day of 15 hours (Bhatt, 1987). In a study of beedi workers in Allahabad (Bhatty, 1987) found that women beedi workers continued to perform their normal domestic functions together with the income generating home based work. Any such work a women is engaged in, is combined with one or all of her other roles that is, of wife, mother and homemaker (Gothoskar, 1989). The home as a work site is a very important area of a women's life. To understand the role of women as workers it is necessary to understand the activities in which the women are engaged. Economists do not consider housework and child rearing as work (Borooah et al, 1994). Since the worker role is money generating, women have to make a choice of whether to combine it with the other roles or separate it from the other roles, and work outside the home (Jumani, 1987; Rani, 1976; Ramanamma and Bambawale, 1987).

In yet another study by Rao and Hussain (1987) on the garment industry in Delhi it was found that it mainly depends on the cheap labour. In India home-based work constitutes an important economic activity for women for many years. As in earlier studies on beedi making, food processing and lace making, to name just a few, home based work is characterized by low wages, long and erratic working hours, isolation and absence from any kind of workers organization (Cloud, 1994). As a consequence the living standards of the workers decline. Most of the women who took up home-based work did so as a means of earning a livelihood (Chaurasia, 1992). "Coming from impoverished families, they had taken this up due to economic necessity caused by erratic employment or unemployment of male family members" (Rao and Hussain, 1987; Wadhera, 1976)

Home-based work unlike factory-based work gave women the opportunity to control and plan their working hours and adjust these to their daily routine. As the burden of housework and childcare cannot be overcome among the economically weaker sections in society, many of the women feel that it is more convenient to do home based work even though the remuneration is very low (Bhanti, 1989). The employer has the maximum advantage – there are no overhead costs, very little investments in tools or machines, or in some cases, no investment at all (Mitra, 1979). There are no trade unions and practically no legislations defining workers rights or requiring welfare measures like providing crèches. The wages are low and most family members

including children are called in to assist resulting in child labour. The larger the family, the more the number of assistants. School attendance is relegated to the background.

Jumani (1987) points out that although there are many advantages for home-based workers, the disadvantages are also great because of their isolation. Rao and Hussain (1987) state that despite working in the same neighborhood, women experienced intense isolation. The chain of agents and sub agents being hidden, the only person visible to the women was the subcontractor who brought them work and who usually lived nearby. Confined to their homes, the majority of the women did not know anything beyond the agent's name.

Noponen's study (1987) in the informal sector in Madras notes "Contractors and exporters dominate the industry and take the advantage of the women's isolation in the home and lack of access to credit, supplies and knowledge about the economics of their work. The workers are at the mercy of the middlemen. The work pattern of the home based workers is distressingly similar – be they beedi workers, lace makers, basket weavers, scrap collection, zari workers, bangle makers, kite makers, chikan workers, path workers, soap makers, paper bag makers and makers of metal caps for bulbs.

The women and children even as young as 4 year olds, start work very early in the morning. Housework and child rearing are somehow crammed into their hectic work schedule (Women's Work & Employment, 1983). The work stretches from six in the morning to ten at night and all for a pittance. The syndrome of powerlessness and poverty, which all the poor suffer, is compounded for working women by male dominance, by culturally determined subservient roles and by low payment for work (Mazumdar, 1985; Pande, 2000).

In a survey conducted among the women beedi workers in the Arcot district in Tamil Nadu, it was found that the men were more comfortable when their wives combined income-generating work with housework and childrearing in the home environment itself. "The men folk are happy that the women of the household are able to earn something sitting at home" (Vasanthi, 1989).

Few accurate statistics exist on the number of women engaged in home based production due to the lack of recognition of home based producers as workers in most national data gathering systems. The numbers in Asia are not only massive but also increasing day by day. In women studies at the grassroots level, it is noted that over ninety per cent of the women work in the unorganized sector (Bhatia, 1989; Madan, 1976).

A majority of the women are to be found in the vast rural and urban unorganized sector. According to an estimate by the

National Commission on Self Employed Women (Bhatt, 1988) 94% of the total female workforce operates within this highly exploitative sector. Only 6% are in the organized sector, that is, they are protected by law.

One of the major reasons for women's work becoming increasingly limited to the unorganized sector is that the women lack the opportunity to acquire skills and training, which could improve their job prospects (Das, 1976). Since women have to bear the major burden of domestic chores, which in a poor household is labour intensive and time consuming, they do not have the time and opportunity to acquire skills and training for more remunerative jobs (NPPFW, 1988-2000; Mathur, 1989).

**Nutritional Awareness: -**

Another factor related to the mother which may influence the nutritional status of the child is her own awareness of the value of different foods (Ariyaratne, 1977).

In a National Family Health Survey conducted by Rao and Rao (1999) it was found that with respect to the provision and use of the health care facilities there was discrimination against girl children. It was also noted that the relationship between a mother's educational level and the treatment given to children by health professionals was consistently positive (Gillespie, 1995). Awareness about ORS is higher among urban mothers than rural mothers (Kanitkar, 1979).

In almost all societies, women are involved in varying degrees in food production management and distribution. Women are also chief caretakers of family nutrition including their own (Melville et al, 1988). Though women perform most of these activities, their control is determined by social and cultural norms (Seshadri, 1994). Within a household, malnutrition does not affect everyone to the same extent. Data on nutritional status disaggregated by sex, while scarce, reveal that in much of South Asia, female children and women are worse off than males (Chatterjee, 1989).

A number of variables affecting the nutritional status of children such as household size, income, educational level of parents, women's participation in economic activities have been studied by various researchers (Aguillon et al 1982, Chaudhry 1984, Ryan, Bidinger, Rao and Pushpanan, 1984). The mother's level of education and consequently her awareness regarding nutrition comes through as a factor promoting dietary adequacy of her children.

In a study based in Gujarat by Seshadri (1994) it was found that women who are anemic did not really relate their condition to any dietary insufficiency. Similarly foods and liquids were given in very small quantities when a child suffered from diarrhea. The mothers were unaware of the importance of replacing the lost body fluids. In the Philippines, the mothers in the family of the normal category of children had a better knowledge of nutrition and infant

feeding practices than those in families of third degree of malnutrition (Aguillon et al, 1982). In yet another study by Devdas et al (1980) it was reported that educational status affects the nutritional status of the community.

Contrary to these findings have been studies in Chandigarh by Wallia and Gambhir (1975), which note that mothers of well-nourished children were as ignorant about essential factors on nutrition as mothers of undernourished children. This is in accordance with the findings by Christian et al (1988), which notes that the mother's knowledge of nutrition did not affect the height for age and weight for age of the children 37-72 months old.

In yet another study by Srivastava (1991) conducted in Banares, it was observed that illiterate mothers have no idea of a balanced diet. They believed that if a child were overfed, it would be healthy. Consequently it was found that children of illiterate mothers showed better nutritional status than children of educated mothers.

There are many factors causing malnutrition in developing countries and most of these factors interact simultaneously (Ghosh, 1977). Ignorance of the mother is one such factor. Devi and Geervani (1998) have found during their research in Andhra Pradesh that the nutritional awareness of the mother was a significant factor influencing the weight for age of the child. Passmore (1983) noted that poverty was more important than ignorance as a cause of widespread under

nutrition and malnutrition affecting children most severely. This view was supported by a study in Ludhiana by Cowan and Dhanoa (1983). They observed that very few of the economically weak families could afford to buy milk and that approximately 90% of the mothers gave no supplements apart from tea before the age of 18 months.

## Other related factors

The roles of various other factors that affect the nutritional status of the pre school child have been studied by a number of researchers. Wray and Aguirre (1969) showed that social and demographic factors interact with poverty and ignorance in a complex web of causation. The data also noted the fact that it is the mother who transmits these factors thus influencing the nutritional status of the child and she herself is affected by some of these factors. In the present study the following have been considered.

**Environmental Factors: –**

Improvement in the quality of the life of the people depends to a great extent on the quality of housing and related facilities, which determine the physical environment (Kamalamma, 1996). The maximum impact of the destruction of biomass sources is on women and children. The difficulties are related to the sexual division of labour, the double work burden at home and outside, the specific nature

of the tasks they do and the unequal distribution of resources like food within the household.

Besides cooking and child rearing, women have to spend a large amount of time around other household needs like fuel, fodder and water (McLaren, 1983). Consequently the time for child rearing is reduced to a minimum. Often it results in weak malnourished children of undernourished mothers. Even pregnant mothers spend 14 to 16 hours on basic activities of the home as reported in a study in western Uttar Pradesh (Agarwal, 1985). Home based workingwomen in a garment export business in Delhi, spent several hours daily fetching water from a hand pump. There were no municipal amenities and the houses had thatched roofs (Rao and Hussain, 1987).

In rural areas the hours spent in fetching water, fuel and fodder corresponds in urban slums to the time spent in queuing for water, rations, kerosene and other necessities (Swaminathan, 1985).

In most parts of Indian, to be born as a girl means to be born to life of drudgery. Mahadevan (1990) states that today most of the landless and poor women spend a major part of the time in fetching water and firewood and cooking besides rearing or sleeping out of excessive fatigue. He goes on to say that if these conditions continue, women will not be able to rear children as they should be reared. They will be a tired and exhausted lot. If the mother is partially freed from

this drudgery, she may render effective care to the children who are most vulnerable (Gupta, 1988).

Environmental factors also include light, toilet facilities, waste disposal, ventilation and space (Khan et al, 1988). Small, poorly lit and ill-ventilated homes, in crowded mohallas and streets serve both as the living space and the work place for almost all home based workers. Inadequate lighting and long working hours cause severe problems like poor vision, eyestrain, backaches and occasionally accidents (Bhatt, 1988). Being home based, the children are also affected by these environmental influences. The prevalence of stunting and underweight increased three fold with the degree of crowding as expressed by the number of persons per room used for sleeping (Victoria et al , 1986)., The size of a house is a mark of social and economic status. Thus it follows that people belonging to the lower economic strata live in cramped settlements and are more likely to encounter nutritional problems. The methods of disposal of refuse and the health of a community are closely related (Graham, 1972). If refuse is allowed to accumulate near the living environment, it becomes a breeding ground for rodents, insects and pathogenic organisms. Air and water pollution follows, affecting the quality of life of the community (Thomas, 2000). Open, overflowing drains and grossly inadequate garbage disposal systems are the rule rather than the exception in these thickly overpopulated areas (Khan and Gupta, 1988). Children are too apathetic to drive away the hordes of flies sitting on ill fed and scantily clad

bodies. The findings of the study by Devi and Geervani, (1998) clearly shows that nutritional problems cannot be solved by access to food alone but by improvements in the overall living standards.

**Family Income: -**

As can be expected, any improvement in the socio economic level affects the nutritional status of the entire family specially the very young children. Studies conducted by the NIN (NNMB, 1997) found that as the income increased, the consumption of cereals, millets and green leafy vegetables decreased but there was a corresponding increase in the consumption of proteins, energy, total fat and riboflavin. High-income group families had a better attitude to health and were of a higher nutritional status as compared to the middle and lower income groups (Muthayya, 1972). Several other studies indicated that family income is the most important factor that determines the nutritional status of the children (Desai et al, 1972, Cutting and Cutting 1972, Devadas, 1974). Poverty was found to be one of the major causes of malnutrition.

In the new social setup there are very many other demands on the family income like housing, clothing, education and entertainment. Money that would have been spent on food has been diverted to these non-food expenditures. In the long run, this results in poor nutritional status, diminished work capacity and poverty (Ghai, 1993). In yet another study

Devadas et al (1980) observed that children belonging to the higher income families were heavier and taller than the children from the lower economic strata.

However, in some studies a positive relation between income and the growth of pre school children was not observed (Swaminathan et al, 1964). This could be due to the fact that habits and customs were more or less the same in the entire population. In a study on women factory workers in the garment industry it was found that 40% of the women contributed between 26-50% of total family income and 20% between 51-75%. The home-based worker contributes somewhat less to the family income (Baud, 1987). It is difficult to estimate the income of the women workers, as work is seasonal, erratic and dependent on good relations with sub contractors. A sizeable proportion of the home-based workers are at the poverty line (Sharma, 1985).

In the beedi making industry, 70% of the households studied by Bhatty (1987) expressed the fear that the withdrawal of the income from beedi making would cause both their food and non-food consumption to fall. Any decline in their income would have distressing consequences on their families. They were all living below the poverty line.

In a paper on balancing economic and child care needs, Saraswathi (1994) observes that when the woman works longer hours in any income producing capacity her income increases and she is able to supply goods and services

*including food to her children but she is less available for* child care or food preparation activities. This is of crucial significance in understanding the connection between women's work for wages and child welfare. There is data on how changes in women's income, the opportunity cost of women's time and women's control over income affect their power to decide on the allocation of family resources and their effect on child welfare (Rogers, 1983).

In a study by Kumar (1978) it was found that as women had access to some cash of their own, they were able to provide additional food and other benefits for their children. Women generally show greater and steadier inputs than men for children's nutrition and health needs (Myers and Indriso, 1987). This view is endorsed in a number of related studies by Engle (1983), Popkin (1983) and Kapadia (1996). The mother's income seems to be a better predictor of a child's nutritional status than the father's income. Clark (1981) states that it is not women's work that causes poor child welfare but it is poverty associated with the low income that women earn.

Saraswathi (1994) goes on to note that the gaps in knowledge related to the connection between women's income generating work and its influence on children far exceeds what is known.

In a study conducted in SriLanka on coir workers Risseeuw (1987) found out that only 19% of the households derived an

income earned by male members alone. In 81% of the households, women also contributed towards the family income.

Finally, it is the amount of money available in the family for food expenditure, which determines the kinds of food eaten. In almost all cases the child is fed adult food (Devi and Geervani, 1998) and unless the quality and quantity of adult food improves there is no hope for the improvement of child feeding.

**Care takers other than the mother: –**

In low-income families the pressure on young mothers to earn is great. The men and all the able bodied will be working or looking for work, and older family members may not also be available for childcare (Kapoor, 1971). All these factors compound the danger of child neglect. Children being the most vulnerable bear the brunt of this situation.

Families of migrant labour are usually nuclear. As both parents work the young children are often neglected (Swaminathan, 1985). Together with the neglect of very young children, the older daughters are persuaded to drop out of school and look after their younger siblings. There is a lack of data on this subject, but older siblings, generally girls, are the primary caretakers of small children. The subsequent care provided is of doubtful value.



The problem of the care of young children when the mother is engaged in income generating activities may be solved either by organized support services like crèches or by informal agencies like family members and obliging neighbors. It is a myth that a woman is the sole caretaker and homemaker (Myers and Indriso, 1987). In order to draw meaningful conclusions, Saraswathi (1994) advocates that the mother is viewed not in isolation but in the context of the household. She stresses the need to study and take into account caretakers other than the mother.

The care and nurturing of infants and young children is primarily the responsibility of women and girls in most developing countries of the world and mothers are not the sole caretakers of the children (Souza, 1979). The age of the child at which the mother begins to transfer the exclusive care to someone else is also relevant (Engle, 1986) to its general health and well being. Members of the household, other than the mother contribute directly or indirectly to the infant's total development. In a large number of societies, which have extended family households, grandparents are heavily involved in childcare (Bhavnagiri, 1994). In a study of six cultures by Minturn and Lambert (1964) grandparents reduced the isolation of the mother and helped her with child rearing.

Sibling care is more prevalent in societies where the women's workload is high and where there are no resources like a good water supply source and other community

facilities (Whiting and Whiting, 1975). In societies where gender roles are clearly differentiated, girls tend to take more care of infants than boys. This is especially true of poor households where children contribute to earning activities, non-earning household production and childcare (Bhavnagiri, 1994).

In a study conducted in a rural area near Bombay it was found that 47% of the children were cared for primarily by older siblings many of whom were between 6 and 8 years themselves (Shah, Walimbe and Dole, 1979). In yet another study on socialization for competence among Harijan boys and girls in a village near Delhi, it was found that by the age of ten and eleven, girls were capable of doing everything in the house and taking care of young ones. This involved caring, feeding, washing and attending to their needs (George, 1973). This is supported by Swaminathan (1985), that in many cultures, girls are specifically raised to have more nurturing and responsible attitudes. She quotes another study in which 60% of the children below the age of six in a tribal area where parents were laborers were taken care of by their siblings and 15% of these caretakers were below the age of six.

Devi and Geervani (1998) found that the type of caretaker of the child was found to be significantly related to weight for age. It was also found that mothers often relied on substitute caretakers when they went out to work. When infants were taken care of by children below 12 years of age, it adversely

affected the weight for age and height for age. The finding was in accordance with the view that, children left in the care of other siblings is likely to be malnourished (Grewal et al, 1973). A surprise finding by Devi and Geervani (1998) was that if the caretaker sibling was older than 12 then the mean height for age and weight for age percent of standard was higher and the children were better cared for. In yet another study conducted in Punjab by Cowan and Dhanoa (1983) it was found that many infants depended on siblings for care. In some cases, small children had to spend many hours alone outside the locked doors of the home. Siblings often did not know what to do for the baby and even the neighbors seemed reluctant to attend to the temporarily abandoned child. One of the recommendations of the project Poshak by CARE in Madhya Pradesh was that child care education needs to be imparted to the young mother substitutes (aged 7-10 years) who generally care for the very young child while the mother is at work (Gopaldas, 1983).

Most of the literature reviewed does not focus on this particularly large and vulnerable section of society – the nutritional status of the children of unorganized women workers – factory based and home based. Hence the need was felt by the researcher to study this aspect of this group in depth.

# Chapter 3

## STUDY DESIGN

### Rationale:

Aligarh is a city in Uttar Pradesh and is situated in the north west of India. Its population according to the Aligarh Nagar Nigam records 1995 is 5,53,041. The total area is 33.98 sq.km. (Census of India, 1991). The proportion of Muslims to the total population in Aligarh is 34.4% (Ahamed, 1993). The city is 135 km away from the country's capital New Delhi.

Despite its proximity, there are many aspects of Aligarh – Child care of working women for one – that are grossly neglected even after fifty years of independence. Aligarh has grown from a small town to an important center for industry and learning. The city is famous for its lock industry, but besides this flourishing industry there are many other small-scale industries (Laskar, 2000).

These small industries rely chiefly on cheap home-based piece rate labor. This large invisible work force is extremely difficult to locate, as they are not part of any national statistics. Rough estimates regarding the female work force in the unorganized sector in India is put at 94 % in ShramShakti a report of the national commission on women in the informal sector.

The very young children of this large segment of our population form the most vulnerable section of society. The present study was undertaken to assess and compare the nutritional status of the young children 1-6 years of working women, factory based and home based.

The effect of the mother's economic activity on the child's nutritional status can be gauged by various methods. The most reliable method of assessing nutritional status are anthropometric measures. The researcher hopes that the findings will help form a basis for formulation of relevant policies.

The four areas selected for the study were Mushtaqnagar, Jeevangarh, Chandaniya and Mahendranagar, all in the city of Aligarh. The location of these areas is shown in the map. The four areas selected did not differ much in the infrastructure – roads, drainage and other community facilities. The socio economic status of the sample studied was also similar. All of them belong to the lower income group. Most of the fathers of the children, if employed were truck loaders or rickshaw pullers. There were drains in all the localities studied but almost all were choked. Heaps of rotting garbage were found at every corner. Though all the four areas studied came under the purview of the Municipal Corporation – provision of sanitary facilities was inadequate. The narrow streets, "galis", were lined with bricks. The drains provided on both sides of the roads were choked and overflowing. Most of the residents did not have access to

municipal water in their homes. Public taps were located at intervals but the respondents complained of erratic water supply. However, most of the houses had hand pumps.

A large number of houses in the Mushtaqnagar area had toilets connected to septic tanks. This practice was gradually being adopted in other areas also. Manual disposal of human excreta was prevalent in parts of Jeevangarh and Chandaniya. Electricity connections were present in all the areas under study though the supply like water was equally erratic. Since a few years, there has been a migration of poor people from adjoining rural areas and also from Bihar, in search of employment. This has resulted in an increase in the city's population. These migrants are willing to work for lower wages than the locals.

**Provisions for Health Care:**

Aligarh city has a medical college under the Aligarh Muslim University, The Jawahar Lal Nehru Medical College. There is also a civil Hospital The Malkhan Singh Hospital and also the Deen Dayal Upadhaya Hospital. There are primary Health Centers and Dispensaries besides private medical practitioners in every street. The allopathic, homeopathic, ayurvedic and unani branches of medicines are practiced here.

**Local Industries:**

A number of industries were functioning in all the areas studied. They were the lock industry, the metal cap industry for mini bulbs, buckles industry, packaging, electroplating on wire jigging, the making of tin containers and rug making. Another home based industry of Aligarh is the appliqué work or patti work industry. For the present study, the workers of the metal(Brass) cap for mini bulb industry and their children in the age group 1-6 years were observed, questioned and measured.

The metal cap for mini bulbs is an industry where almost the entire labour force consists of home based women workers. In a few areas some women go to the factories to work, leaving their young children in the care of an older sibling. Some women carry the children to the factory – an environment totally unsuited to the well being of the child.

**Methodology:**

A pilot test was conducted on children of working women in Begumbag an area adjoining Chandaniya. Pretesting was done on 32 children in the age group of 1-6 years, 20 women workers and 3 factories.

The sample of factory based and home based working women was selected purposively with the condition that they had at least one child in the age group 1-6 years.

The researcher visited each household and interviewed the mothers. The children were observed and measured. Wherever possible, the work environment was also observed. The age and sex wise distribution of the sample of each area was tabulated for further analysis.

| Age (months) | Mushtaq nagar | | Mahendra nagar | | Jeevangarh | | Chandaniya | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| 12-23 | 6 | 9 | 8 | 10 | 9 | 11 | 7 | 11 | 71 |
| 24-35 | 8 | 4 | 5 | 3 | 6 | 4 | 7 | 2 | 39 |
| 36-47 | 5 | 9 | 4 | 7 | 6 | 5 | 7 | 5 | 48 |
| 48-59 | 6 | 6 | 8 | 5 | 5 | 7 | 10 | 7 | 54 |
| 60-71 | 9 | 2 | 7 | 2 | 8 | 6 | 11 | 4 | 49 |
| 72-78 | 10 | 12 | 7 | 7 | 9 | 6 | 6 | 2 | 59 |
| Total | 44 | 42 | 39 | 34 | 43 | 39 | 48 | 31 | 320 |

***Table 3.1:*** Age and Sex wise distribution of the sample of each area studied.

The total sample consisted of 63 factory based working women and 149 non-working women (home based). The child sample consisted of 320 children, 107 of factory based working women and 213 of home based working women.

A three-tier questionnaire was formulated based on the ICMR pre school examination record. The questionnaire for the unit and the worker was constructed with the help of the Labour Bureau, Ministry of Labour, Govt. of India. The questionnaire formulated for the unit required information regarding the annual turnover, number of employees, details

of women employees - age, marital status, criteria for fixing wages and actual wages paid, hours of work and welfare measures provided. The employer was also asked if there were provisions for a crèche, water supply, toilet facilities and medical care for the women workers. Questions on training and supervision were also included and lastly reasons for employing or not employing women. After pretesting, as per the requirements of the present empirical study, some pertinent questions were added and the questionnaire was modified for use.

The worker level questionnaire had questions regarding age, religion, marital status, whether local or migrant, the type of family and its size and composition. There also were queries on total family income, time allocations for various activities, food patterns and preferences, treatment of sons and daughters, whether children shared the work area and whether there was any other caretaker other than the mother. The role of the media regarding the food items consumed was also asked. Particulars regarding children's illnesses and deaths were also asked.

**Nutritional Status Assessment:**

The nutritional status of the children of the sample was assessed primarily by anthropometric measures. Studies on the physical developments of infants and children are important as they provide determinants of a nation's health.

According to the Indian Council of Medical and Research, measurements of height and weight are still the simplest and one of the most reliable means by which the progress of a normal child is evaluated.

The measurement of growth has been a widely used tool of health or nutritional status of children. The process of normal growth and development of children is dependent on an adequate and timely supply of nutrients. Undernutrition is reflected in an impairment of growth and consequently a useful indicator of nutritional status. Growth retardation is an important quantifiable manifestation of undernutrition (Gopalan and Chatterjee, 1985).

Nutritional status may be assessed under three broad headings as follows –

1. Anthropometric
2. Biochemical
3. Clinical Symptoms and Dietary Intake.

There are several biochemical and endocrinal parameters like serum albumin, transferrin, thyroxin binding, pre albumin, retinal binding protein and insulin like growth factor used for assessment, but the need for difficult procedures to be followed make it an impractical tool specially in the context of the present study. A number of clinical symptoms in Protein Energy Malnutrition and Vitamin Deficiency states may be detected, however a majority of these symptoms are

not specific enough for a layperson to identify McDivitt and Mudambi, (1969) Many of the clinical signs of malnutrition do not appear until the child is severely malnourished. Of the three anthropometric indicators of body weight, height, body circumferences are by far the most objective and quantifiable indicators (Rao, 1986). For practical purposes anthropometry is the most useful parameter for assessing the nutritional status of children (Sachdev and Chaudhry, 1994). There has also been an international consensus by the WHO working group that for defining the nutritional status of children anthropometry is the most readily available of assessment and therefore the most logical.

A variety of anthropometric measures are used to assess the growth of the child. The measures most commonly used are height, weight, mid upper arm circumference (MUAC), chest circumference, head circumference and calf circumference.

Height is a measure of the linear growth of the body – the degree of skeletal development. This is a measure, which does not change as rapidly as weight. The child to be measured was made to stand bare foot on a flat surface with feet parallel and the heels, buttocks and back of the head touching the measuring rod. The sliding vertical plate was lowered till it gently made contact with the erect head. Reading was noted to the nearest 0.01 cm. Children who were unable to stand were similarly measured on a flat surface.

Weight is affected within a short duration of inadequate nutrient intake and ill health. The weight of the children was recorded on a lever actuated weighing scale to the nearest 0.01 kg. The scales were checked for accuracy with standard weights. The children were weighed wearing only one light item of clothing and without any footwear. The weight of the mother was also recorded.

The mid upper arm circumference was measured with a steel tape passing around the upper arm mid way between the acromion and the olecranon or at the maximum circumference of the biceps muscle. The measurement of the circumference of the mid upper arm proves to be useful and practical means of assessing protein calorie deficiency of early childhood. This measurement is independent of age and is particularly useful in the nutritional assessment of populations in rural areas where no exact birth records are noted. E.F.P.Jelliffe, 1983, has made a similar observation.

Generally weight, height and mid upper arm circumference have come to be considered the most sensitive parameters of under 5 nutritional status and most practical for the monitoring of individual children or of population of children (Gopalan and Chatterjee, 1985). The MUAC and weight for height are age independent anthropometric measures. When related for age weight and height provide the means to study a child over a period of time. When a child's age is difficult to gauge, the MUAC and weight for height measures may be used. The weight for height may be measured by comparing

the child's weight with the expected weight for a healthy child of the same height. These measurements have been used to distinguish different types of malnutrition. Weight and height measures are adequate for assessing nutritional status and not much is gained by additional forms of measurement (Rao et al, 1979).

The head circumference was measured by placing the tape firmly round the frontal bones, above the eyebrows and passing it around the head over the maximum occipital prominence at the back.

The chest circumference was measured by passing the tape around the body of the child at the line of the nipple at right angles to the vertebral column. Chest circumference becomes equal to the head circumference at one year of age and after two years it becomes more than head circumference in a normal well-nourished child. In cases of protein energy malnutrition (PEM) the chest circumference is smaller than the head circumference even beyond two years of age (Mehta, 1999). Calf circumference was measured at the midway of the knee and the ankle at its fullest width.

**Age Assessment of the Child:**

One of the important prerequisites in nutritional anthropometry is an accurate assessment of age. In the selected sample of the present study birth certificates were not available and hence the exact ages could not be

obtained. A local events and festivities calendar was used. 'The child was born just before Bakr-Id 3 years ago, or, during Ramzan last year'. An extra age interval 72-78 months was added to cover any wrong reporting of age.

**Clinical Symptoms and Dietary Intake:**

Obvious clinical symptoms were noted. The eyes skin and hair, teeth, gums and nails were examined for protein energy malnutrition and vitamin deficiencies. The mothers or caretakers were questioned regarding the dietary intake of the child, frequency of feeding, food preferences and amounts consumed.

**Work Pattern of the Mother:**

The sample consisted of 212 working and non-working mothers, 149 were home based while 63 were working in factories. The factory-based mothers either took their infants along to the work place or left them with older siblings. The home based mothers attended to their children, household tasks and the economic activity within the four walls of their ill lit and ill ventilated homes. The literacy levels and nutritional awareness of the women were observed and noted.

**Environment Sanitation, Personal Hygiene and Infrastructural Inputs of Health:**

Provision for drinking water and water for daily activities of the household were observed. Toilet facilities were also noted. Roads, drains and type of housing were observed as these factors could influence the health status of the children. Garbage and waste disposal facilities were noted. Questions related to the immunization of the child were also asked.

**Family Income:**

The various sources of income were taken into account. This included the income of the various family members and also income from milch animals and poultry.

**Caretakers other than the Mother:**

The researcher also noted that the caretaker other than the mother and their role in child care. Repeated visits were made to check and verify observations.

**Reference Standards:**

The first stage in nutritional anthropometry is recording and grouping the observations in such a way that they are internationally intelligible and comparable. A reference base is needed and it is immaterial from what population that

base is drawn provided that it is large enough for proper statistical definition (Waterlow et al, 1977; Habicht and Mason, 1983). Anthropometric measures noted by the experts in anthropology, statistics, nutrition and pediatrics of the Working party of the Indian Council of Medical Research have been referred to in the study. These developmental standards were based on studies on Indian infants and children in a cross sectional study from different states. There is still a lot of debate as to whether an international or national reference standard should be utilized (Agarwal, et al 1999).

The growth standard considered to represent normal growth and which is currently being widely used for the purpose of evaluation of growth performance in many countries including India is the one developed by the National Center of Health Statistics (NCHS) of USA. This is based on growth measurements of large measurements of American children. It was found by an expert group of the World Health Organization (WHO) that the NCHS, CDC growth reference was the best suited for use as an international reference since it met most of the criteria considered necessary for the choice of a standard (Gopalan, 1994).

The NCHS standard does not differ significantly from the Harvard standard in use earlier, especially for young children. Classification on assessment of growth performance suggested by the Indian Academy of Pediatrics' was also using the Harvard Standards. Children from the

lower socio economic groups in the developing countries may fall much below the international standards but it does not mean that each nation establishes different sets of standards and in that case any improvement in nutrition in the country will change the 'standard' itself (Gopalan and Chatterjee, 1984).

Basically the standards used must determine the magnitude of the problem and not the problem determine the standards (Desai and Mukherjee, 1999). The current consensus is to use the NCHS data as a international reference population and to use it as a standard appears appropriate (Sachdev, 1994).

Nutritional status of children may be classified in a number of ways. The most commonly used classifications are the Gomez, Jelliffe and the classification by the Indian Academy of Pediatrics. These classifications are based on the weight for age of the child. The NCHS and the Waterlow classifications are based on weight for height, height for age and weight for age based on NCHS standards. These are the currently accepted international classifications.

According to Gomez's classification, the point of demarcation or cutoff points determines the excess of malnutrition in a study population.

| | | |
|---|---|---|
| 90-110% of standard weight for age | | Normal |
| 75-90% | " | Mild Malnutrition |
| 60-74% | " | Moderate Malnutrition |
| Below 60% | " | Severe Malnutrition |

In Jelliffe's classification there is a slight variation of the cut off points. This is also based on weight for age.

| Nutritional Grade | % of Standard Weight for Age ($50^{th}$ Centile of Harvard Standards) |
|---|---|
| Normal | 90 |
| Grade I | 80-90 |
| Grade II | 70-79 |
| Grade III | 60-69 |
| Grade IV | less than 60 |

Source: IAP Textbook of Pediatrics

The Nutrition Sub Committee of the Indian Academy of Pediatrics recommended the following classification.

| Nutritional Grade | % of Standard Weight for Age |
|---|---|
| Normal | >80 |
| Grade I | 71-80 |
| Grade II | 61-70 |
| Grade III | 51-60 |
| Grade IV | <50 |

The drawbacks of Gomez's, Jelliffe's and IAP classifications are that they are based on Harvard Standards, which are no longer recognized as an international reference. The NCHS Standards do not differ significantly from the Harvard standards as far as the under 5's are concerned though there is some minor difference with respect to the older age groups. In national programmes in India, the Harvard Standard has been extensively used for the assessment of growth performance (Gopalan, 1994).

The currently accepted international classification based on NCHS standards is summarized below.

| Indices | Nomenclature for Deficit of Index | Cut Off Points % of Reference Median |
|---|---|---|
| **Weight for Height** | Wasting | <80 |
| **Height for Age** | Stunting | <90 |
| **Weight for Age** | Underweight | <80 |
| | Severe underweight | <60 |

Age independent anthropometry includes measurement of mid upper arm circumference and weight for height. The degree of wasting can be measured by comparing the child's weight with expected weight for a healthy child of the same

height. Combinations of these measurements have been used to distinguish different types of malnutrition.

In chronic malnutrition the child is stunted with weight for age and height for age being low. In acute malnutrition height for age is normal but weight for age is low. This condition is referred to as wasting. In nutritional short stature the weight/height is equal; the child may pass off as a normal child of a lower age if the chronological age is not known.

Mid upper arm circumference measurement is age independent. Any child in the age group 1-5 years whose MUAC is less than 12.5cms is classified as undernourished (Parthasarathy, 1999).

***The Kanawati Index:***

It is useful in detecting Protein Energy Malnutrition in young children. It is calculated by dividing the MUAC by the head circumference. The interpretation is as follows –

| | |
|---|---|
| Normal | >0.32 |
| Mild Undernutrition | 0.28-0.32 |
| Moderate Undernutrition | 0.25-0.28 |
| Severe Undernutrition | <0.25 |

***The Rao Index:***

It is calculated as follows –

$$(\text{Weight}/\ \text{Height}^2) \quad x\ 100$$

Values less than 0.15 indicates malnutrition. This remains more or less constant up to 5 years of age.

***The Quetlet's Index:***

This is based on the relationship between weight and height and is expressed as

Weight (kgs)/ Height (cms)

Normal values vary from 0.14 to 0.16. In gross malnutrition it is less than 0.14. This is a reliable ratio for assessing malnutrition (IAP Textbook of Paediatrics, 1999).

**Statistical Methods used for the Analysis of Data:**

To analyze the differences in the nutritional status of the children of the factory based working women and the children of the home based working women the t-test for difference of means was used. The indicator of the nutritional status to be compared was taken to be the weight for height, as it has been seen to be the most reliable indicator of nutritional status.

The t-test values were calculated for each height interval, and comparison was conducted between the weights of the children of the factory based working women and the children of the home based working women for each of those height categories.

Based on the differences between the calculated value of t and the tabulated value of t, at different levels of significance, the hypothesis was analyzed as true or false.

Based on the changes in the true and false values with the change in age (months), the trends and patterns in the nutritional status of the children of factory based working women and the children of home based working women was identified which were helpful in examining the relationships between the work pattern of the mother and the nutritional status of the child.

The Hypothesis used for the t-test is as follows –

There is no significant difference between the nutritional status of the children of factory based working women and the children of the home based working women.

To examine the relationship between the mother and the nutritional status of the child, the dependent and independent variables were identified.

The independent variable identified was the presence or absence of the mother.

The dependent variable identified was the nutritional status of the child (either normal or below normal).

The Chi-square test of independence was undertaken using a 2x2 fold contingency table.

The Chi-square test represents a useful method of comparing experimentally obtained results with those to be expected theoretically on some hypothesis. The equation for Chi Square ( $X^2$ ) is stated as follows.

$$X^2 = \frac{(f_o - f_e)^2}{f_e}$$

in which

$f_o$ = frequency of observed or experimentally determined facts

$f_e$ = expected frequency of occurrence on some hypothesis.

The differences between observed and expected frequencies are squared and divided by the expected number in each case and the sum of these quotients in $X^2$.

In a 2 x 2 fold contingency table, the chi-square is given by the following formula

$$X^2 = \frac{N\,(AD - BC)^2}{(A+B)(C+D)(A+C)(B+D)}$$

where

| | | | |
|---|---|---|---|
| Boys | **A** | **B** | **A+B** |
| Girls | **C** | **D** | **C+D** |
| | **A+C** | **B+D** | **N** |

A, B, C & D are frequencies for boys and girls for a pair of attributes and N is the Total of the frequencies.

The Hypothesis to be tested was defined as

The presence of the mother significantly affects the nutritional status of the child.

The calculated and tabulated values of Chi-square were compared to test the hypothesis put forward by the researcher.

# CHAPTER 4

## FINDINGS

The present study was carried out in the city of Aligarh. Its objective was to assess and compare the nutritional status of the young children of working and non-working women - factory based and home based. The various factors affecting the health status of the children and the physical and social environments were also identified. The data were collected during the period June 1998 to May 1999.

The sample was selected from four different areas of the city – Mushtaqnagar, Mahendranagar, Jeevangarh and Chandaniya. The age and sex wise distribution of the children is shown in the table 4.1, 4.2.

| Age (Months) | Boys | Girls | Total |
|---|---|---|---|
| 12-23 | 5 | 17 | 22 |
| 24-35 | 13 | 5 | 18 |
| 36-47 | 5 | 14 | 19 |
| 48-59 | 11 | 4 | 15 |
| 60-71 | 17 | 5 | 22 |
| 72-78 | 7 | 4 | 11 |
| **Total** | 58 | 49 | 107 |

***Table 4.1***: Age and Sex-wise Distribution of Sample – Children of Working Women (Factory based)

| Age (months) | Boys | Girls | Total |
|---|---|---|---|
| 12-23 | 25 | 24 | 49 |
| 24-35 | 13 | 8 | 21 |
| 36-47 | 17 | 12 | 29 |
| 48-59 | 18 | 21 | 39 |
| 60-71 | 18 | 9 | 27 |
| 72-78 | 25 | 23 | 48 |
| **Total** | 116 | 97 | 213 |

***Table 4.2***: Age and Sex-wise Distribution of Sample – Children of Non-Working Women (Home Based).

In both the groups boys outnumbered girls marginally. In the group of children of factory based working women, there were 58 boys and 49 girls, while in the non-working women group (home based), there were 116 boys and 97 girls.

***Birth Order:***

It was found that most of the children of working women (factory based) had a birth order 2, 3 and 4 while the most of the children of non working women (home based) had a birth order of 4 and 3 as can be clearly seen in the tables 4.3 and 4.4.

| Birth Order | Male | Female | Total |
|---|---|---|---|
| 1 | 6 | 8 | 14 |
| 2 | 8 | 15 | 23 |
| 3 | 12 | 13 | 25 |
| 4 | 10 | 11 | 21 |
| 5 | 14 | 2 | 16 |
| 6 | 6 | 0 | 6 |
| 7 | 2 | 0 | 2 |
| **Total** | 58 | 49 | 107 |

***Table 4.3***: Distribution by Birth Order of Sample – Children of Working Women (Factory based).

| Birth Order | Male | Female | Total |
|---|---|---|---|
| 1 | 13 | 4 | 17 |
| 2 | 25 | 10 | 35 |
| 3 | 14 | 28 | 42 |
| 4 | 29 | 37 | 66 |
| 5 | 18 | 10 | 28 |
| 6 | 11 | 7 | 18 |
| 7 | 6 | 1 | 7 |
| **Total** | 116 | 97 | 213 |

***Table 4.4***: Distribution by Birth Order of Sample – Children of Non Working Women (Home based).

**Anthropometric Measurements:**

The following tables show the anthropometric measurements of the sample children in both the groups.

***Height:*** The mean heights for age of the sample studied have been shown in the Tables 4.5 and 4.6.

| Age (months) | Boys Mean Height (cms) | Girls Mean Height (cms) |
|---|---|---|
| 12-23 | 72.0 | 66.3 |
| 24-35 | 80.3 | 80.0 |
| 36-47 | 86.0 | 85.7 |
| 48-59 | 94.3 | 94.0 |
| 60-71 | 101.5 | 100.0 |
| 72-78 | 105.5 | 103.0 |

***Table 4.5***: Distribution by Height for Age of Sample – Children of Working Women (Factory based).

| Age (months) | Boys Mean Height (cms) | Girls Mean height (cms) |
|---|---|---|
| 12-23 | 68.0 | 64.8 |
| 24-35 | 74.6 | 73.5 |
| 36-47 | 85.0 | 84.3 |
| 48-59 | 95.5 | 87.0 |
| 60-71 | 98.8 | 97.0 |
| 72-78 | 105.3 | 107.5 |

***Table 4.6***: Distribution by Height for Age of Sample – Children of Non Working Women (Home based).

In both the groups, the mean heights for age of the boys were more than the mean heights of the girls. The only age interval where this was not found was in the 72-78 months interval of the home-based group.

***Weight:*** It was observed that the weight for age differences were more pronounced than the height for age differences between the sexes and also the two groups, indicating the sensitivity of weight as a measure of nutritional status.

| Age (months) | Boys Mean Weight (kgs) | Girls Mean Weight (kgs) |
|---|---|---|
| 12-23 | 7.0 | 5.6 |
| 24-35 | 10.0 | 9.5 |
| 36-47 | 12.1 | 11.4 |
| 48-59 | 13.0 | 12.5 |
| 60-71 | 14.0 | 13.0 |
| 72-78 | 16.5 | 16.0 |

***Table 4.7:*** Distribution by Weight for Age of Sample – Children of Factory based Working Women.

| Age (months) | Boys Mean Weight (kgs) | Girls Mean Weight (kgs) |
|---|---|---|
| 12-23 | 6.6 | 5.6 |
| 24-35 | 7.8 | 7.0 |
| 36-47 | 11.3 | 11.0 |
| 48-59 | 11.8 | 11.2 |
| 60-71 | 12.6 | 14.0 |
| 72-78 | 15.5 | 15.8 |

***Table 4.8:*** Distribution by Weight for Age of Sample Children of Home based Working Women.

***Sitting Height:*** It was found that the children of factory based working women had higher values of sitting height than the children of home based workers. The mean sitting height of the boys was more than the mean sitting height of the girls in both the groups. The differences in mean sitting heights between the boys and the girls was seen to be more marked till the age of 48-59 months, after which there were only imperceptible differences. This was true of both the groups as shown in tables 4.9 and 4.10.

| Age (months) | Boys Mean Sitting Height (cms) | Girls Mean Sitting Height (cms) |
|---|---|---|
| 12-23 | 44.0 | 41.5 |
| 24-35 | 47.6 | 47.0 |
| 36-47 | 51.0 | 52.5 |
| 48-59 | 53.2 | 52.0 |
| 60-71 | 55.0 | 52.0 |
| 72-78 | 58.5 | 56.0 |

***Table 4.9:*** Distribution by Mean Sitting Height of Sample – Children of Factory based Working Women.

| Age (months) | Boys Mean Sitting Height (cms) | Girls Mean Sitting Height (cms) |
|---|---|---|
| 12-23 | 43.8 | 43.2 |
| 24-35 | 47.6 | 48.0 |
| 36-47 | 51.0 | 50.0 |
| 48-59 | 51.2 | 50.7 |
| 60-71 | 53.6 | 51.5 |
| 72-78 | 56.8 | 56.6 |

***Table 4.10:*** Distribution by Mean Sitting Height of Sample – Children of Home based Working Women.

***Head Circumference:*** The Mean Head Circumferences were calculated separately for boys and girls for both the groups. These are presented in the tables 4.11 and 4.12.

| Age (months) | Boys Mean Head Circumference (cms) | Girls Mean Head Circumference (cms) |
|---|---|---|
| 12-23 | 43.1 | 42.0 |
| 24-35 | 45.3 | 45.0 |
| 36-47 | 47.0 | 46.0 |
| 48-59 | 47.9 | 47.0 |
| 60-71 | 49.0 | 47.5 |
| 72-78 | 49.5 | 48.2 |

***Table 4.11:*** Distribution by Mean Head Circumference of Sample – Children of Factory based Working Women.

| Age (months) | Boys Mean Head Circumference (cms) | Girls Mean Head Circumference (cms) |
|---|---|---|
| 12-23 | 43.3 | 41.6 |
| 24-35 | 44.6 | 44.5 |
| 36-47 | 46.5 | 45.8 |
| 48-59 | 47.8 | 46.7 |
| 60-71 | 48.3 | 47.6 |
| 72-78 | 48.8 | 48.0 |

***Table 4.12:*** Distribution by Mean Head Circumference of Sample – Children of Home based Working Women.

In all the cases the mean head circumference of the boys was more than that of the girls for the related intervals.

***Chest Circumference:*** The Mean Chest Circumferences were calculated for the boys and girls of both the groups and these have been tabulated as follows in tables 4.13 and4.14.

| Age (months | Boys Mean Chest Circumference (cms) | Girls Mean Chest Circumference (cms) |
|---|---|---|
| 12-23 | 44.0 | 42.0 |
| 24-35 | 46.3 | 45.0 |
| 36-47 | 52.0 | 48.5 |
| 48-59 | 51.6 | 53.0 |
| 60-71 | 54.0 | 50.0 |
| 72-78 | 54.0 | 56.0 |

***Table 4.13:*** Distribution by Mean Chest Circumference of Sample – Children of Factory based Working Women.

| Age (months) | Boys Mean Chest Circumference (cms) | Girls Mean Chest Circumference (cms) |
|---|---|---|
| 12-23 | 41.6 | 40.5 |
| 24-35 | 47.0 | 44.0 |
| 36-47 | 47.3 | 49.6 |
| 48-59 | 50.0 | 49.0 |
| 60-71 | 50.6 | 54.0 |
| 72-78 | 54.6 | 54.6 |

***Table 4.14:*** Distribution by Mean Chest Circumference of Sample – Children of Home based Working Women.

As in the case of head circumference, gender differences could be seen. In the majority of the cases chest circumferences of the boys were more than that of the girls.

***Mid Upper Arm Circumference (MUAC):*** The mean values for the mid upper arm circumference were calculated separately for boys and girls in both the groups. These are presented in the tables 4.15 and 4.16.

| Age (months) | Boys Mean MUAC (cms) | Girls Mean MUAC (cms) |
|---|---|---|
| 12-23 | 13.0 | 12.1 |
| 24-35 | 13.0 | 13.0 |
| 36-47 | 13.8 | 13.6 |
| 48-59 | 14.6 | 14.2 |
| 60-71 | 15.3 | 15.0 |
| 72-78 | 16.5 | 16.0 |

***Table 4.15:*** Distribution by Mean MUAC of Sample – Children of Factory based Working Women.

| Age (months) | Boys Mean MUAC (cms) | Girls Mean MUAC (cms) |
|---|---|---|
| 12-23 | 12.1 | 12.0 |
| 24-35 | 12.3 | 12.3 |
| 36-47 | 13.0 | 13.0 |
| 48-59 | 13.8 | 13.5 |
| 60-71 | 14.4 | 14.0 |
| 72-78 | 15.5 | 15.0 |

***Table 4.16:*** Distribution by Mean MUAC of Sample – Children of Home based Working Women.

It can be observed that the mid upper arm circumference of the boys was equal to or slightly higher than the mean mid upper arm circumference of the girls of the corresponding age intervals.

***Calf Circumference:*** The mean calf circumference values are presented in the tables 4.17 and 4.18.

| Age (months) | Boys Mean Calf Circumference (cms) | Girls Mean Calf Circumference (cms) |
|---|---|---|
| 12-23 | 15.0 | 14.0 |
| 24-35 | 15.6 | 15.0 |
| 36-47 | 18.0 | 17.8 |
| 48-59 | 18.3 | 18.0 |
| 60-71 | 19.2 | 19.0 |
| 72-78 | 20.0 | 19.5 |

***Table 4.17:*** Distribution by Mean Calf Circumference of Sample – Children of Factory based Working Women.

| Age (months) | Boys Mean Calf Circumference (cms) | Girls Mean Calf Circumference (cms) |
|---|---|---|
| 12-23 | 14.3 | 13.8 |
| 24-35 | 15.6 | 15.0 |
| 36-47 | 17.2 | 17.0 |
| 48-59 | 17.8 | 17.3 |
| 60-71 | 18.0 | 17.8 |
| 72-78 | 18.5 | 18.2 |

***Table 4.18:*** Distribution by Mean Calf Circumference of Sample – Children of Home based Working Women.

In consonance with the earlier findings, the mean calf circumference of the boys of both the groups is marginally higher than the mean calf circumference of the girls of the corresponding age intervals.

***Clinical Symptoms and Nutrient Intake:*** It was found that most of the children had sparse dyspigmented hair and pale conjunctiva indicative of anaemia. The total number of children who did not show clinical symptoms of any deficiency was 35 out of 107.

| Clinical Symptoms | Boys | Normal Boys | Girls | Normal Girls |
|---|---|---|---|---|
| Dyspigmented Hair | 34 | 24 | 35 | 14 |
| Pale Conjunctiva | 15 | 43 | 29 | 20 |
| Skin Problems | 25 | 33 | 38 | 11 |
| Pot Belly | 12 | 46 | 17 | 32 |
| No Visible Signs | | 24 | | 11 |

***Table 4.19:*** Distribution of Sample CFBWW by Clinical Symptoms

The total number of children among home based working women who did not show any clinical symptoms of any nutrient deficiency was 57 out of 213 thus showing that children of the previous group were healthier than the latter group.

| Clinical Symptoms | Boys | Normal Boys | Girls | Normal Girls |
|---|---|---|---|---|
| Dyspigmented Hair | 80 | 36 | 65 | 32 |
| Pale Conjunctiva | 83 | 33 | 73 | 24 |
| Skin Problems | 45 | 71 | 37 | 60 |
| Pot Belly | 34 | 82 | 43 | 54 |
| No Visible Signs | | 33 | | 24 |

***Table 4.20:*** Distribution of Sample CHBWW by Clinical Symptoms

The nutrient intake of almost all the children was cereal based i.e., mainly carbohydrate. The vegetable most frequently eaten was the potato.

***Immunization:*** On being questioned, it was found that in the group of children of factory based working women the percentage of children immunized was 57% while among the children of home based working women the percentage was much lower at 30.51%. This can be seen in table 4.21 and 4.22.

| Age (months) | Boys | Girls |
|---|---|---|
| 12-23 | 0/5 | 5/17 |
| 24-35 | 9/13 | 4/5 |
| 36-47 | 0/5 | 11/14 |
| 48-59 | 8/11 | 0/4 |
| 60-71 | 9/17 | 4/5 |
| 72-78 | 7/7 | 4/4 |
| **TOTAL** | 33/58 | 28/49 |

***Table 4.21:*** Distribution of Children of Factory based working women immunized at each age interval.

| Age (months) | Boys | Girls |
|---|---|---|
| 12-23 | 0/25 | 8/24 |
| 24-35 | 8/13 | 4/8 |
| 36-47 | 8/17 | 4/12 |
| 48-59 | 5/18 | 7/21 |
| 60-71 | 0/18 | 5/9 |
| 72-78 | 9/25 | 7/23 |
| **TOTAL** | 30/116 | 35/97 |

***Table 4.22:*** Distribution of Children of Home based working women immunized at each age interval.

A higher percentage of girls were found to be immunized. This finding showed that the sex of the child did not matter regarding immunization against disease.

## Findings related to the Mother

The unorganized sector in the labour force in India is among one of the most neglected and women workers in this large sector have the worst deal. The present study was undertaken in the city of Aligarh, which has the dubious distinction of having a very large number of this statistically invisible workforce. The total sample consisted of 63 factory based working women and 149 non-working women (home based). This is presented in table 4.23.

| Work Pattern | Number |
|---|---|
| **Factory based (working)** | 63 |
| **Home based (non-working)** | 149 |
| **Total** | 212 |

***Table 4.23:*** Distribution of Sample of Mothers by Work Pattern.

Tables 4.24 and 4.25 show the stated age of these workers against their work pattern. In the home based work, most of the workers were between the ages of 26 and 33 while the majority of the factory based women workers were in the age group 34 to 41. Most of the home-based workers were migrant women from Eastern UP and Bihar as is seen in Table 4.24.

| Age (years) | FBWW |
|---|---|
| 18-25 | 9 |
| 26-33 | 21 |
| 34-41 | 31 |
| 42 and above | 2 |
| Total | 63 |

***Table 4.24:*** Distribution of Sample Factory based Working Women by Stated Age.

| Age (years) | HBWW |
|---|---|
| 18-25 | 25 |
| 26-33 | 66 |
| 34-41 | 54 |
| 42 and above | 4 |
| **Total** | 149 |

***Table 4.25:*** Distribution of Sample Home based working Women by Stated Age.

| | |
|---|---|
| **Local** | 50 |
| **Migrant** | 13 |

***Table 4.26:*** Distribution of Sample Factory based working Women by Area of Origin.

| | |
|---|---|
| **Local** | 68 |
| **Migrant** | 81 |

***Table 4.27:*** Distribution of Sample Home based working Women by Area of Origin.

It was found that most of the factory based working women were of local origin while the majority of the home based working women were migrants from near by states.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Unmarried** | 0 | 0.00 | 0 | 0.00 |
| **Married** | 98 | 65.78 | 48 | 76.19 |
| **Divorced/Separated** | 37 | 24.83 | 5 | 7.94 |
| **Widowed** | 14 | 9.39 | 10 | 15.87 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 4.28:*** Distribution of Sample by Marital Status.

The majority of women in both the groups were married and living with their husbands but a greater percentage 24.83% of the home based working women were either divorced or separated as compared to only 7.94% of the factory based working women.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Hindu** | 14 | 9.39 | 51 | 80.95 |
| **Muslim** | 135 | 90.61 | 12 | 19.05 |
| Total | 149 | 100 | 63 | 100 |

***Table 4.29:*** Distribution of Sample by Religious Affiliations.

Most of the factory based working women were from Hindu families while 90.61% of the home-based workers were Muslims.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Nuclear** | 114 | 76.51 | 45 | 71.42 |
| **Extended** | 24 | 16.11 | 18 | 28.58 |
| **Joint** | 11 | 7.38 | | 0.00 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 4.30:*** Distribution of Sample by Type of Family

The majority of the working women from both the groups lived in nuclear families. There were no factory based working women from joint families.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **2-3** | 9 | 6.04 | 7 | 11.11 |
| **4-6** | 103 | 69.13 | 36 | 57.14 |
| **7-9** | 25 | 16.77 | 17 | 26.98 |
| **10 & more** | 12 | 8.06 | 3 | 4.77 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 4.31:*** Distribution of Sample by Size of Family.

The average family size among factory based working women was 4-6. It was the same among the home based working women's group also.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Illiterate** | 139 | 93.28 | 49 | 77.77 |
| **Primary school** | 10 | 6.72 | 14 | 22.23 |
| **Total** | 149 | 100 | 63 | 100 |

***Table 4.32:*** Distribution of Sample by Literacy of Mothers.

The majority of the women from both the groups 93.28% and 77.77%, were illiterate.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Regular** | 40 | 26.84 | 17 | 26.98 |
| **Erratic** | 58 | 38.92 | 31 | 49.20 |
| **No Husband** | 51 | 34.24 | 15 | 23.8 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 4.33:*** Distribution of Sample by Employment of Husband.

The majority of the husbands of both the groups surveyed did not have regular employment and therefore the family depended largely on the mother's income for survival.

## Other factors

Among some of the other factors identified which affect the health of the children, were community facilities like the provision of potable water. It was found that 54.36% of the home based group and 68.25% of the factory based working women had satisfactory facilities for potable water. They had hand pumps in their houses.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Water** | 81 | 54.36 | 43 | 68.25 |
| **No Satisfactory Provision** | 68 | 45.64 | 20 | 31.75 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 4.34:*** Distribution of Sample by Provision for Potable Water.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Provision** | 56 | 37.58 | 33 | 52.38 |
| **No Provision** | 93 | 62.42 | 30 | 47.62 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 4.35A:*** Distribution of Sample by Provision for Toilets.

A larger percentage of the home based group had no provision for toilets (62.42%) as compared to 47.62% of the factory based group.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **<500** | 108 | 72.48 | 44 | 69.84 |
| **501-1000** | 36 | 24.16 | 17 | 26.98 |
| **1001-1500** | 5 | 3.36 | 2 | 3.18 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 4.35B:*** Distribution of Sample by Family Income per month (Rs.).

The majority of the working women studied in the sample had incomes less than Rs.500 a month. Only about four percent of women from both the groups had incomes between Rs.1000-1500 per month.

Very young children who had not started to walk by themselves were carried around first by the mother and then by the older siblings. Often the sibling was a sister. Once the child started to walk, it was seen tagging along with older children the caretaker took care of the child as well as she knew with scant regard to its comfort. Not being able to afford toys, the younger child was usually a doll substitute for the older one.

## Situation Analysis

The physical situation of the sample studied was distressingly similar. On an average the women earned Rs.15-20 per day. If they worked 30 days it worked out Rs.450-600 per month. The amount was mainly spent on food. The men occasionally supplemented this by bringing meat or vegetables depending on their religious leanings. On their return from work, a certain amount was spent on drink, beedis or on wayside snacks samosas or jalebis. The major portion was put away for a house of their own and later for the daughters 'dahej'. Immediate nutritional requirements were not given much weightage. The entire family (average family size 6) subsisted on the woman's earnings. There was

rampant borrowing from the moneylenders at exorbitant rates of interest.

Food was cooked twice a day, usually roti with chutney, vegetables or dal were cooked three times a week and meat about twice a month depending on payments received. Except on festivals nothing special was made in the house, either for the children or for the pregnant or lactating women. The value system was the decisive factor for the spending of scarce resources. The idea of investing in nutritious food for young children was not thought about. The relation between clean nutritious protein rich foods and better mental and physical abilities was not understood. This is mainly due to the illiteracy of the parents especially the mother. So long as the child was quiet, may be apathetically so, and its stomach full, everybody was satisfied.

The child till it began to walk, precariously clung on to the ill-fed and very often pregnant mother. Once it started to walk it was relegated to the background while the mother went on with her various household duties and her income generating work. Immunization, regular health check ups and balanced diets are not paid much attention to. As most families were large, one child's illness did not assume the significance it does in small families. One child more or less was not a matter of grave concern, more so, if the child happened to be a girl.

The flood of information by the national media does not seem to have made any perceptible change in the lifestyles of the majority of the economically weaker sections. The observable changes were the acquisition of multi-colored talcum powders, garish electronic gadgets that stopped functioning almost as soon as they were bought but helped to enhance the prestige of the buyer among his peers. The ubiquitous T.V. set was a necessity in most homes of the sample studied. The justification for it's buying was quick to be offered. It was not right to send grown up daughters to neighbors' houses to watch T.V. programmes. Most of the programs avidly watched were the film based ones. Any useful information, regarding childcare or health of women, was rarely, if ever watched. 90% of the working mothers were involved in economically productive home-based work. Only about 10% went to the factories nearby. Home-based work seemed to fit in with their time use patterns and was more flexible. In almost all the cases the woman was not the only one involved with the hand press, who ever was free pitched in to help. It usually became a home-based occupation for the women and their children. Increased production meant increased income. This translated into more food for the family.

The nutritional status of the children depended more on the food availability in the family rather than the accessibility of the mother. Children seemed to grow up by themselves without any noticeable help from the family. Nobody had the time to spend on special childcare activities.

It suited the factory owners not to encourage women workers to work at the factory premises. They were free to come and go as and when they wanted to. Home based and piece rate work meant that the employers did not have to provide water, toilets or crèche facilities to the workers. Moreover they were treated as casual labor not on the rolls.

# Chapter 5

## Discussion

The characteristics of the sample selected from the four zones in the city of Aligarh, were similar in that the socio-economic levels were the same, the physical infrastructure regarding the work and home environment were also fairly representative of the families living in the area. These were then further analyzed and interpreted keeping in mind the objectives and hypothesis of the study. The results were discussed under the following heads –

1. **Factors related to the Child** – Age, Sex, Birth Order, Anthropometry, Assessment of Nutritional Status, Clinical Symptoms and Nutrient Intake and Immunization.

2. **Factors related to the Mother** – Work Pattern and Nutritional Awareness, Marital Status.

3. **Other Factors** - Potable Water, Toilet facilities, Family Income, Type of Family, Size of Family, Origin, Religion, Husband's Employment, Caretakers other than the Mother.

**Age of the Child:**

It was observed in the study that children irrespective of the group they belonged to, of factory based mothers or home based mothers, were in moderate and severe malnutrition especially in the age intervals of 12-23 months, 24-35 months and 36-47 months – the girls more so. As age increased and probably because the children were able to fend for themselves, the grade of malnutrition was not so severe. In the last age interval studied, of 72-78 months there were greater percentages of normal children. As the sample studied consisted of illiterate mothers of the lowest social strata and who were not able to state ages accurately, this extra age interval was taken. As no birth records were available to verify age a local events calendar was used.

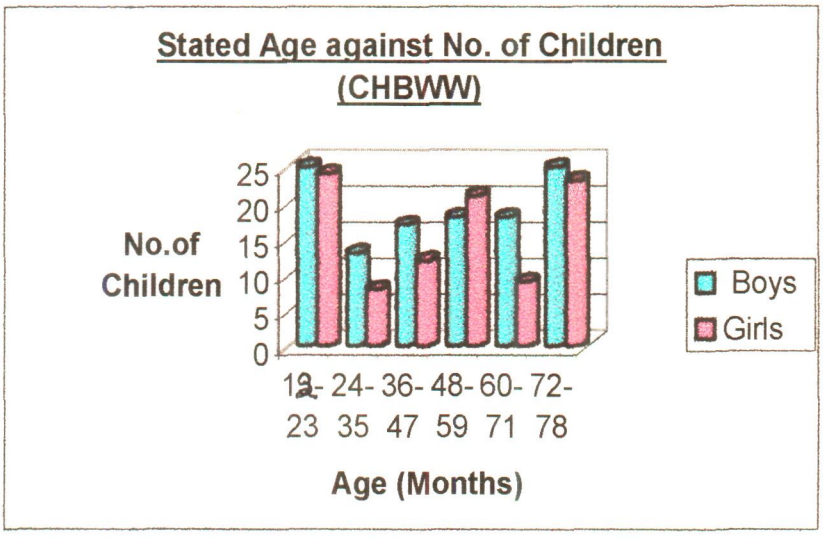


Fig.1

The largest percentage of severely malnourished children was in the age group of 12-23 months. This finding is in agreement with Wray and Aguirre (1969), Devi and Geervani (1998). It has been found that the most critical age interval for nutritional risk has shifted from school age to pre-school age especially from infancy to early childhood (Ghassemi and Teply, 1983). When breast-feeding is no longer able to fulfill the requirements of the fast growing child there is likely to be an increase in the prevalence of undernutrition. Another study by Rajaram et al (1990), found on analysis of the age specific death rate of children in India, that 41% of the deaths of children in the age group 0-4 years occurred due to severe malnutrition.

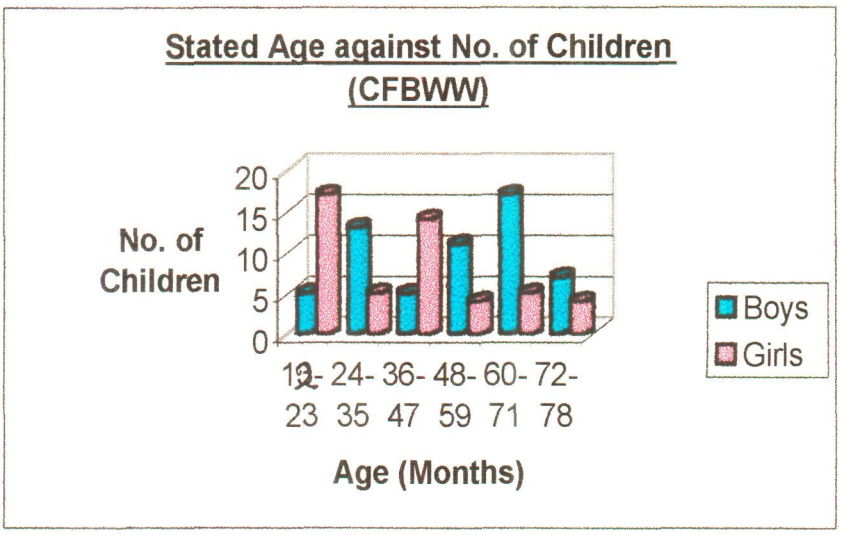


Fig.2

The NNMB report (1997) also states that the prevalence of severe undernutrition was more in the younger age group. In the group of children of factory based mothers, the high rate

of malnutrition in the age intervals below 36 months may be due to irregular childcare as the children are usually left in the care of a not much older sibling. Malnutrition may continue to manifest itself in the growth pattern through the pre school years. In the case of the children of home based mothers – the mother is usually too busy earning the extra rupee in the income generating activity – to pay much attention to the growing nutritional needs of the child. Till the child is able to take and eat food by itself, it is fed a small but inadequate portion of the adult diet, which is mainly Roti and chutney. UNICEF (1990, 1997) emphasizes that a child under 3 years of age needs feeding twice as often as an adult, and that the food should be energy dense. Diluted watery dal may fill the stomach temporarily but the child begins to feel hungry soon after. Many studies have reported that the proportion of the severely malnourished children under two years of age is nearly four times greater than the proportion of five year olds in this condition (Ballweg, 1972). This is in agreement with the findings of the present study.

**Sex of the Child:**

It can be seen from the findings of the present study that even after 50 years of independence in India the scales are tipped against the female child. In 1991 the gender ratio was 927 females per 1000 males. In Uttar Pradesh it was 885 while in western U.P. it is 879 in the age group 0-9 years (Dreze and Gazdar). Aligarh city, the locale of the study, is

in western U.P. The sex wise distribution of the children can be seen. The boys outnumbered the girls marginally. According to the Gomez's classification there was a larger percentage of severely malnutritioned girls in the CHBWW group – 28.8% as compared to the boys – 22.41%. Among the children of factory based working mothers there were no boys who were severely malnourished while there were 20.4% girls belonging to grade 3 of malnutrition. Jelliffe's classification of nutritional grades also showed the similar results.

According to the classification recommended by the Indian Academy of Pediatrics, 26.8% of the girls were in grade 3 and grade 4 of malnutrition as compared to 17.24% of the boys in the home based group. The children of factory based working women there were no boys in grade 3 and grade 4 while there were 18.36% girls in these grades. Refer page 143, 144

According to the NCHS Classification, which is the internationally accepted classification, there were a larger percentage of girls who were wasted and stunted (34.69%) as compared to the boys (24.13%) in the factory based mothers group. In the other group the percentage difference of malnutrition between the boys and the girls was not so marked - 37.93% of the boys and 34.02% of girls. Infact the girls were marginally better as regards wasting and stunting. This is in agreement with the findings of Bhuiya et al (1986) and the recent NNMB report (1997). A point to be noted was that wasting and stunting among girls was the highest during

the age intervals of 12-23 months and 24-35 months. This finding is in accordance with the studies conducted all over the world indicating the fact that malnutrition is more commonly seen among girls than boys (Wray and Aguirre, 1969, Mandelbaum, 1970, Grewal et al, 1973, Aguillon et al, 1982 and The World Bank report, 1996). Girls from infancy to adulthood are the worst victims of malnutrition as a result of social discrimination. Being girls they get less education and less nutrition than their brothers. Consequently they suffer greater degrees of malnutrition, fall prey to all infections and consequently grow up to be weak and under weight mothers of sickly children. This observation is also highlighted in the disaggregated picture in the National Nutrition Policy 1993 which states that in the prevailing patterns of intra-household food distribution, particularly in rural families, there is a grave danger to the nutritional status of women and children, especially girls (UNICEF, 1998).

**Birth Order:**

There was a gradual decline in the number of girls after birth order 4 in both the groups studied – the home based and the factory based. This finding is open to interpretation. The higher the birth order, the larger the number of children already present in the family. The collective availability of nutrients in a family may not represent individual nutrient intake (Chen, 1983).

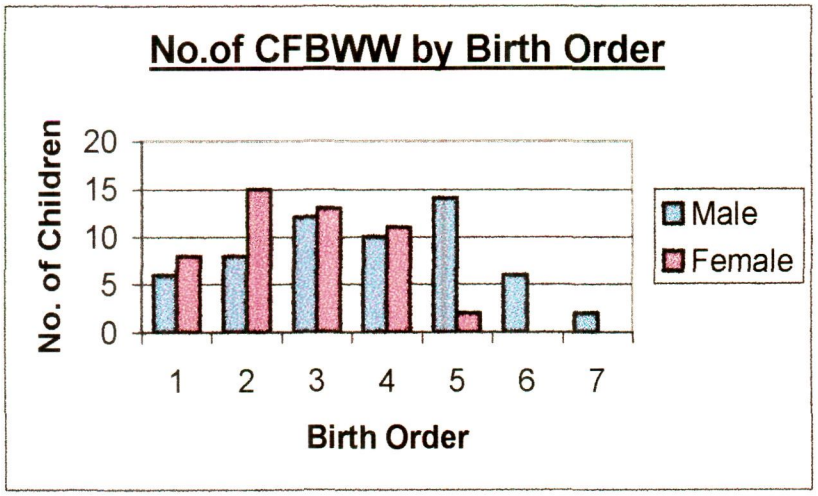


Fig.3

Distribution of food within a family depends primarily on the sex and birth order of the child. This view is endorsed by an action research study on the girl child by Anandalakshmy, 1994. The first-born daughter had an edge over the girls born later. The findings of the present study are in accordance with the finding of the above quoted study. The percentage of girls of $5^{th}$, $6^{th}$ and $7^{th}$ birth orders in the children of the factory based working women is only 4.08% of the sample of girls while in the children of home based working women it is 18.55%.

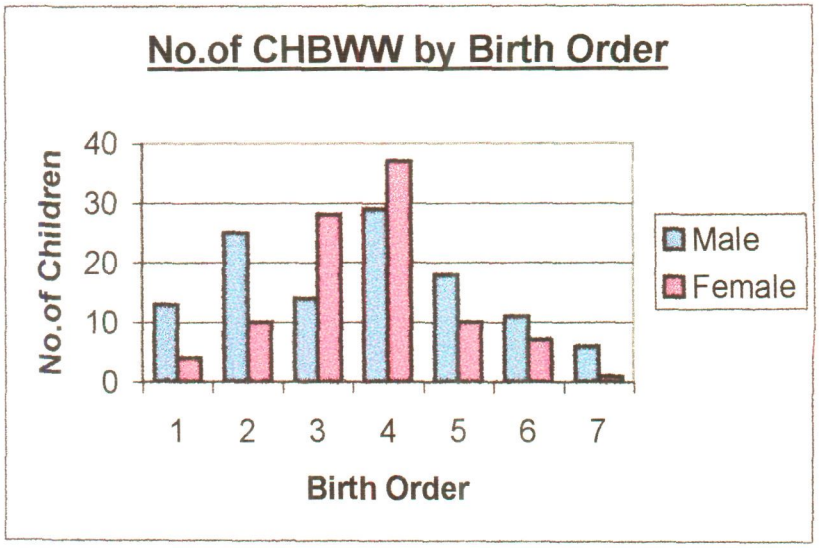


Fig.4

Further study needs to be conducted with a larger sample to identify the exact relationship of birth order, sex and nutritional status of children.

**Anthropometric Measurements of the Child:**

Anthropometry helps in the assessment of the sub clinical stages of malnutrition. It has been recognized as reliable tool in the identification of nutritionally vulnerable groups. The measurements, which were taken for the study are the ones most commonly, used – body weight, standing height, sitting height, mid upper arm circumference, head circumference, chest circumference and calf circumference.

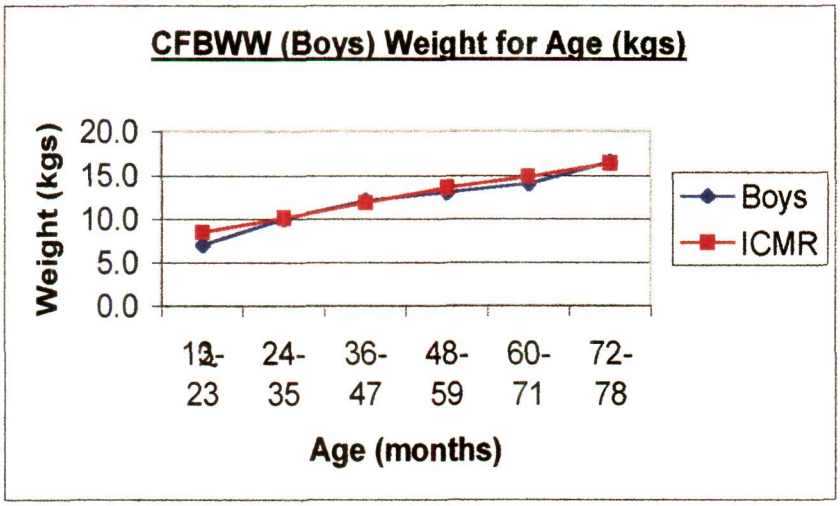
CFBWW (Boys) Weight for Age (kgs)
Weight (kgs)
20.0
15.0
10.0
5.0
0.0
12-23
24-35
36-47
48-59
60-71
72-78
Age (months)
Boys
ICMR

Fig.5

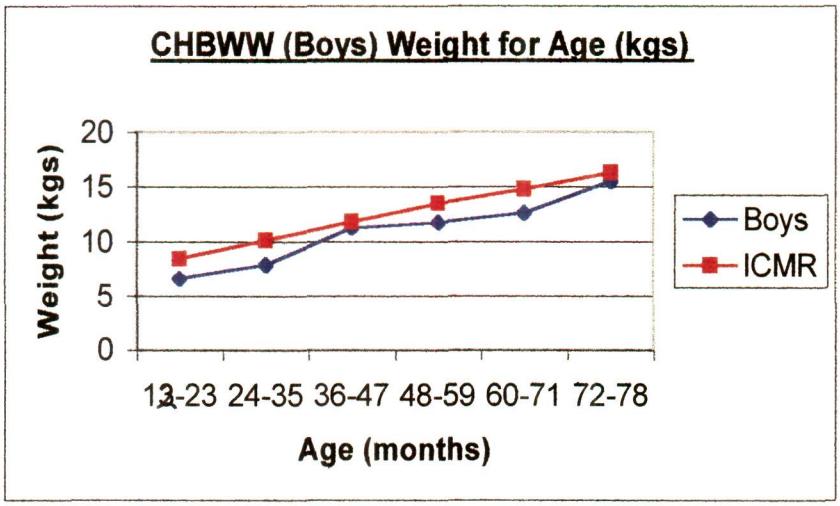
CHBWW (Boys) Weight for Age (kgs)
Weight (kgs)
20
15
10
5
0
12-23 24-35 36-47 48-59 60-71 72-78
Age (months)
Boys
ICMR

Fig.6

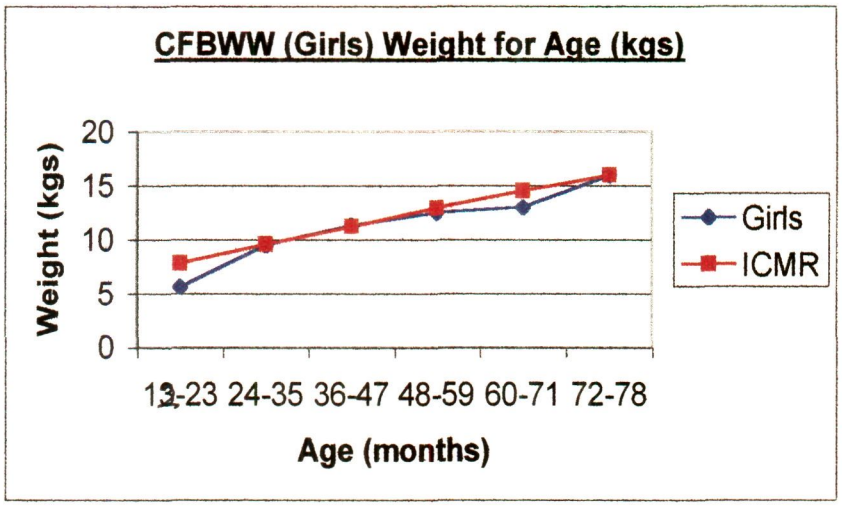
CFBWW (Girls) Weight for Age (kgs)
Weight (kgs)
20
15
10
5
0
12-23 24-35 36-47 48-59 60-71 72-78
Age (months)
Girls
ICMR

Fig.7

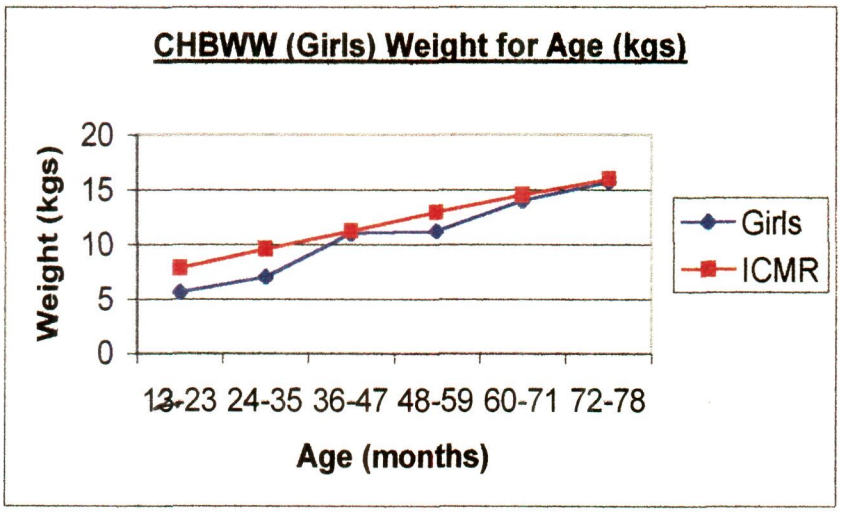
CHBWW (Girls) Weight for Age (kgs)
Weight (kgs)
20
15
10
5
0
12-23 24-35 36-47 48-59 60-71 72-78
Age (months)
Girls
ICMR

Fig.8

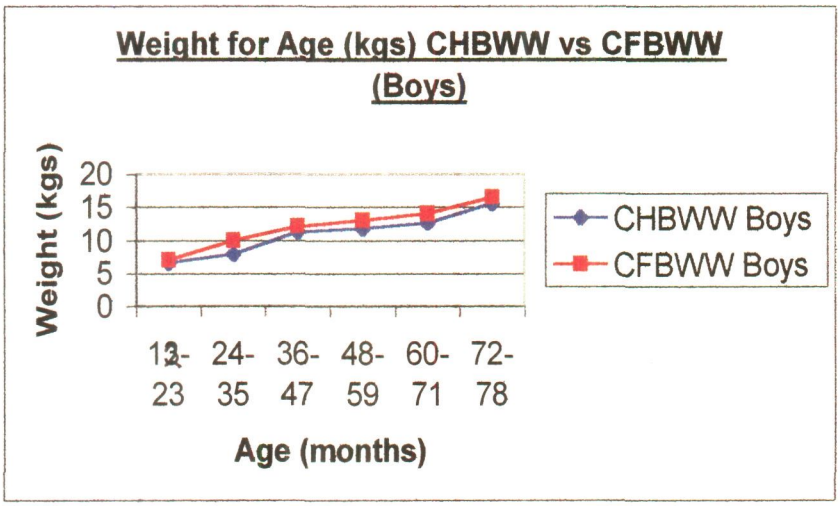


Fig.9

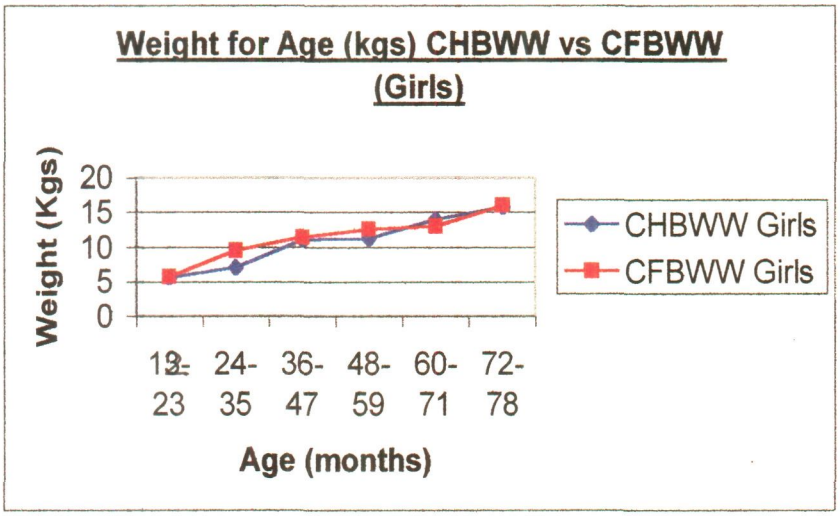


Fig.10

Body weight is the most widely used and the simplest reproducible anthropometric measurement for the evaluation of nutritional status of young children. Serial measurements of weight, as in growth monitoring are more sensitive indicators of changes in nutritional status than a single measurement at a point of time, however, it is sensitive even

to small changes in nutritional status due to childhood morbidities like diarrhea (Rao and Vijayaraghavan, 1975).

| Age (months) | CFBWW | CHBWW | ICMR | IAP | NCHS |
|---|---|---|---|---|---|
| **12-23** | 7.00 | 6.58 | 8.40 | 10.63 | 11.43 |
| **24-35** | 10.00 | 7.83 | 10.10 | 12.86 | 13.66 |
| **36-47** | 12.10 | 11.25 | 11.80 | 14.60 | 15.70 |
| **48-59** | 13.00 | 11.75 | 13.50 | 16.23 | 17.70 |
| **60-71** | 14.00 | 12.60 | 14.80 | 18.13 | 19.70 |
| **72-78** | 16.50 | 15.55 | 16.30 | 19.60 | 21.20 |

***Table 5.1:*** Comparison of Mean Weights of Sample (Boys) against Reference Standards Ref. Fig 5,6,9

| Age (months) | CFBWW | CHBWW | ICMR | IAP | NCHS |
|---|---|---|---|---|---|
| **12-23** | 5.62 | 5.58 | 7.80 | 10.33 | 10.73 |
| **24-35** | 9.50 | 7.00 | 9.60 | 12.56 | 12.90 |
| **36-47** | 11.37 | 11.00 | 11.20 | 14.30 | 15.00 |
| **48-59** | 12.50 | 11.20 | 12.90 | 15.93 | 16.83 |
| **60-71** | 13.00 | 14.00 | 14.50 | 17.83 | 18.60 |
| **72-78** | 16.00 | 15.75 | 16.00 | 18.60 | 20.05 |

***Table 5.2:*** Comparison of Mean Weights of Sample (Girls) against Reference Standards Ref. Fig 7,8,10

It was found in the study that the children of mothers who worked in factories weighed more than the children of home

based mothers but the weights of children of both the groups were lower than the ICMR, IAP and the NCHS Standards clearly show this. Moreover children in the age intervals of 12-23 months and 24-35 months had much lower weights for age than children at higher age intervals. When the child is dependent on the others for feeding and care it loses out but once it starts to fend for itself and can communicate its wants, it begins to improve. It was also found that the weights of the boys in all the class intervals except in the 72-78 months were heavier than the girls. This is in accordance with the findings of (Bakshi and Bhandari , 1972, Chaudhuri , 1975 and Srivastava, 1991).

On comparison of mean weights of boys from both the groups, it was found that though both initially weighed the same (6.58 and 7.00 kgs) the sons of factory based working women attained weight faster and had a slight edge over the sons of home based mothers. This difference was true in the case of girls also. The daughters of the home-based working women were lighter in weight at all the age intervals except the 60-71 months interval.

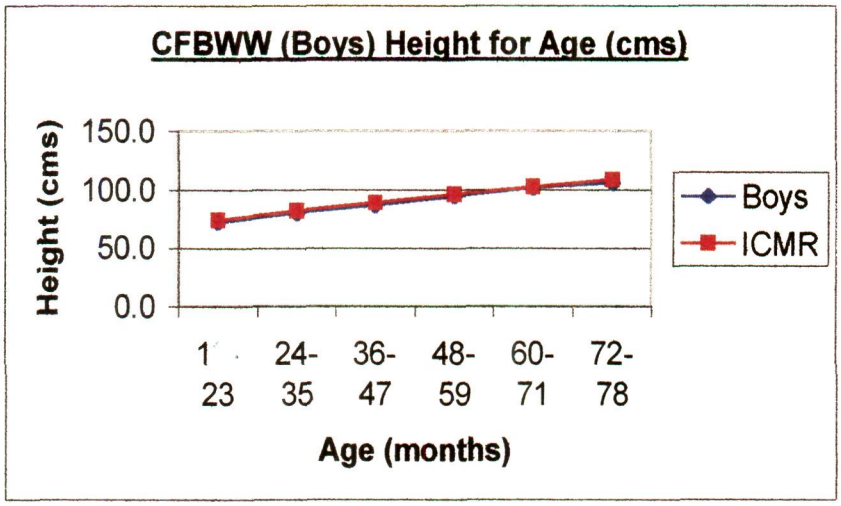
CFBWW (Boys) Height for Age (cms)
Height (cms)
150.0
100.0
50.0
0.0
1 - 23
24-35
36-47
48-59
60-71
72-78
Age (months)
Boys
ICMR

Fig.11

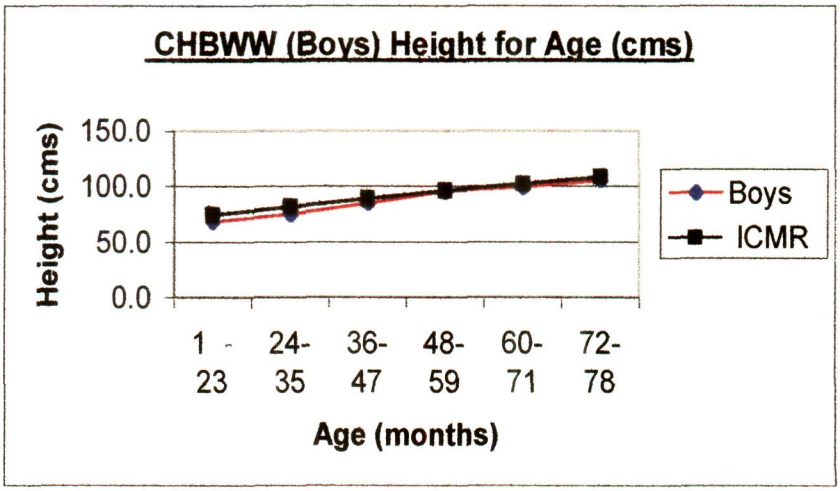
CHBWW (Boys) Height for Age (cms)
Height (cms)
150.0
100.0
50.0
0.0
1 - 23
24-35
36-47
48-59
60-71
72-78
Age (months)
Boys
ICMR

Fig.12

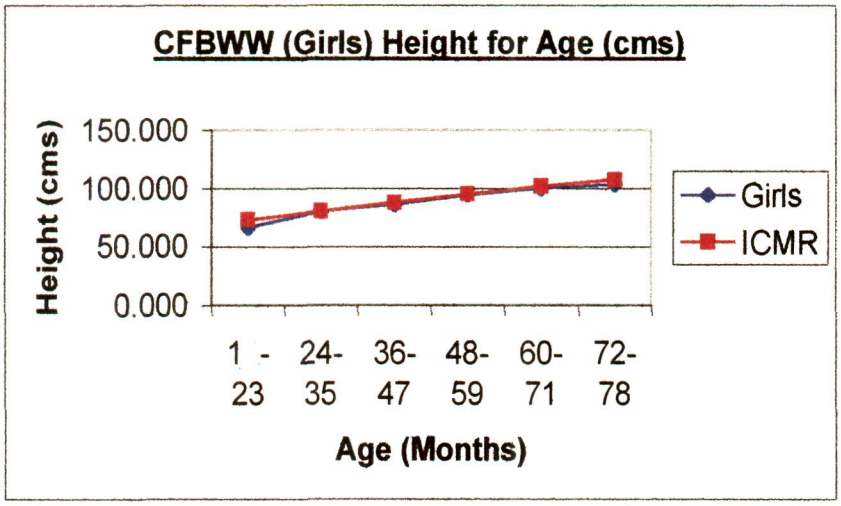
CFBWW (Girls) Height for Age (cms)
Height (cms)
150.000
100.000
50.000
0.000
1 - 23
24- 35
36- 47
48- 59
60- 71
72- 78
Age (Months)
Girls
ICMR

Fig.13

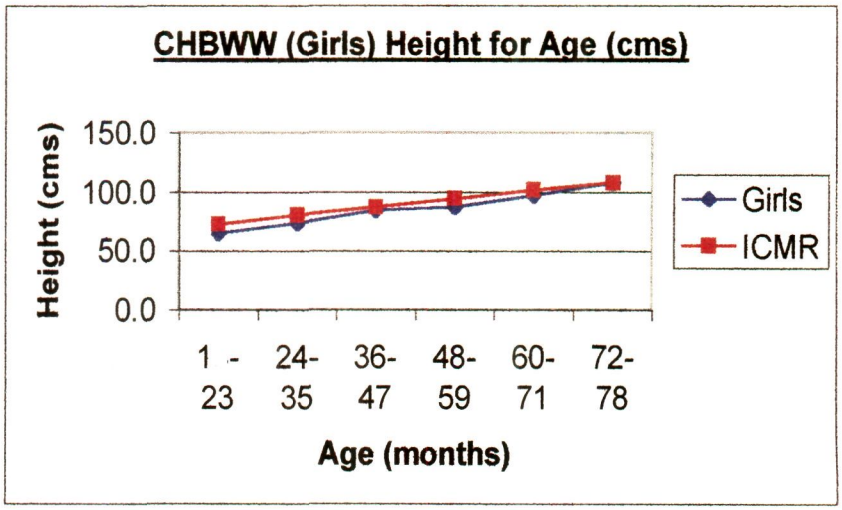
CHBWW (Girls) Height for Age (cms)
Height (cms)
150.0
100.0
50.0
0.0
1 - 23
24- 35
36- 47
48- 59
60- 71
72- 78
Age (months)
Girls
ICMR

Fig.14

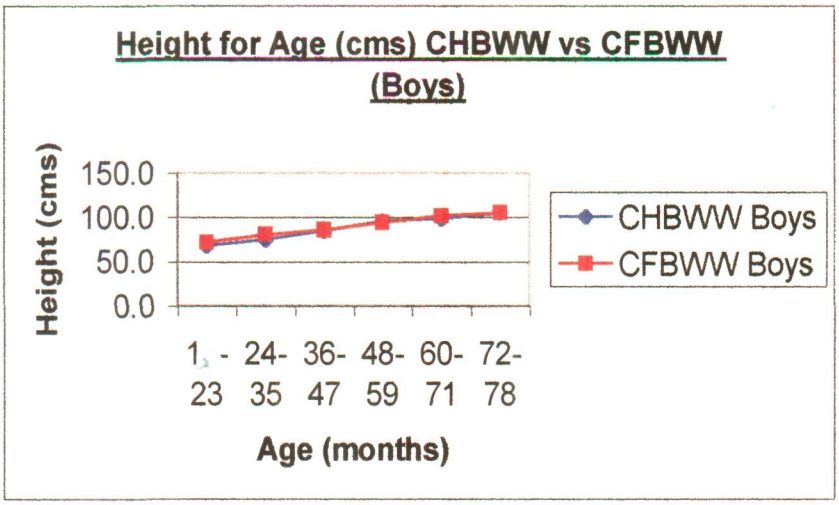
Height for Age (cms) CHBWW vs CFBWW (Boys)
Height (cms)
150.0
100.0
50.0
0.0
1 - 23
24- 35
36- 47
48- 59
60- 71
72- 78
Age (months)
CHBWW Boys
CFBWW Boys

Fig.15

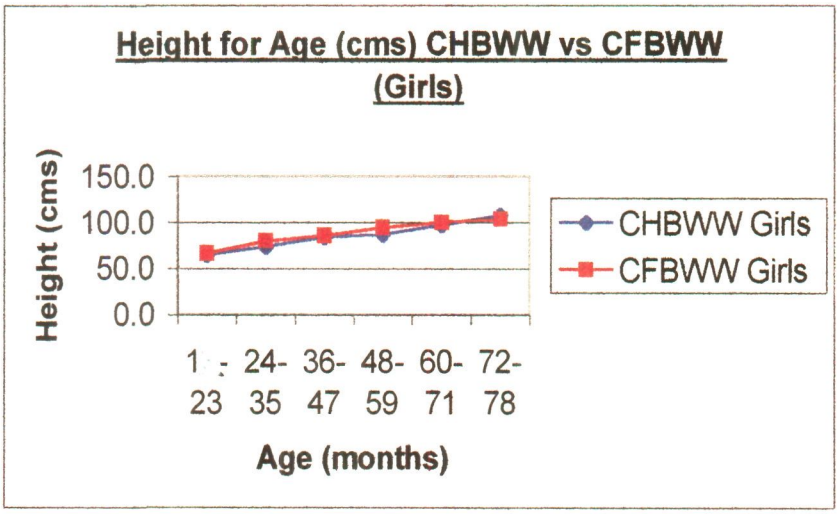
Height for Age (cms) CHBWW vs CFBWW (Girls)
Height (cms)
150.0
100.0
50.0
0.0
1 - 23
24- 35
36- 47
48- 59
60- 71
72- 78
Age (months)
CHBWW Girls
CFBWW Girls

Fig.16

| Age (months) | CFBWW | CHBWW | ICMR | IAP | NCHS |
|---|---|---|---|---|---|
| **12-23** | 72.00 | 68.00 | 73.90 | 80.33 | 82.03 |
| **24-35** | 80.30 | 74.60 | 81.60 | 90.30 | 92.13 |
| **36-47** | 86.00 | 85.00 | 88.80 | 97.63 | 99.50 |
| **48-59** | 94.30 | 95.50 | 96.00 | 103.56 | 106.46 |
| **60-71** | 101.50 | 98.80 | 102.10 | 109.93 | 112.76 |
| **72-78** | 105.50 | 105.30 | 108.50 | 115.45 | 117.55 |

***Table 5.3:*** Comparison of Mean Heights of Sample (Boys) against Reference Standards. Ref. Pg 11,12

| Age (months) | CFBWW | CHBWW | ICMR | IAP | NCHS |
|---|---|---|---|---|---|
| **12-23** | 66.25 | 64.80 | 72.50 | 79.43 | 80.56 |
| **24-35** | 80.00 | 73.50 | 80.10 | 89.40 | 91.13 |
| **36-47** | 85.70 | 84.30 | 87.20 | 96.60 | 98.36 |
| **48-59** | 94.00 | 87.00 | 94.50 | 102.90 | 105.03 |
| **60-71** | 100.00 | 97.00 | 101.40 | 109.46 | 111.53 |
| **72-78** | 103.00 | 107.50 | 107.40 | 113.80 | 116.10 |

***Table 5.4:*** Comparison of Mean Heights (Girls) against Reference Standards. Ref. Pg 13,14

The mean heights of the sample studied have been shown in table 5.3 and 5.4. It was found that the mean heights of children from both the factory based working women and the home based working women were lower than the ICMR and the IAP standards and much lower than the NCHS standards.

However it was noted that the children of factory based working mothers were nearer the ICMR standards than the other group studied. In both the groups the mean heights of the boys was greater than the mean heights of the girls. This finding again is in agreement with the findings of Gadre et al, 1973 and Srivastava et al, 1979. Any acute nutritional deprivation is soon manifested in weight loss whereas a lack of height is indicative of chronic nutritional deficiency. From the present study it was found that only 5.6% of the factory based group children and only 6.5% of the home based group were normal. According to the NCHS standards, 43.12% of the entire sample was stunted i.e. had low heights for age and 21.56% were both stunted and wasted. Tab 5.20 - 23

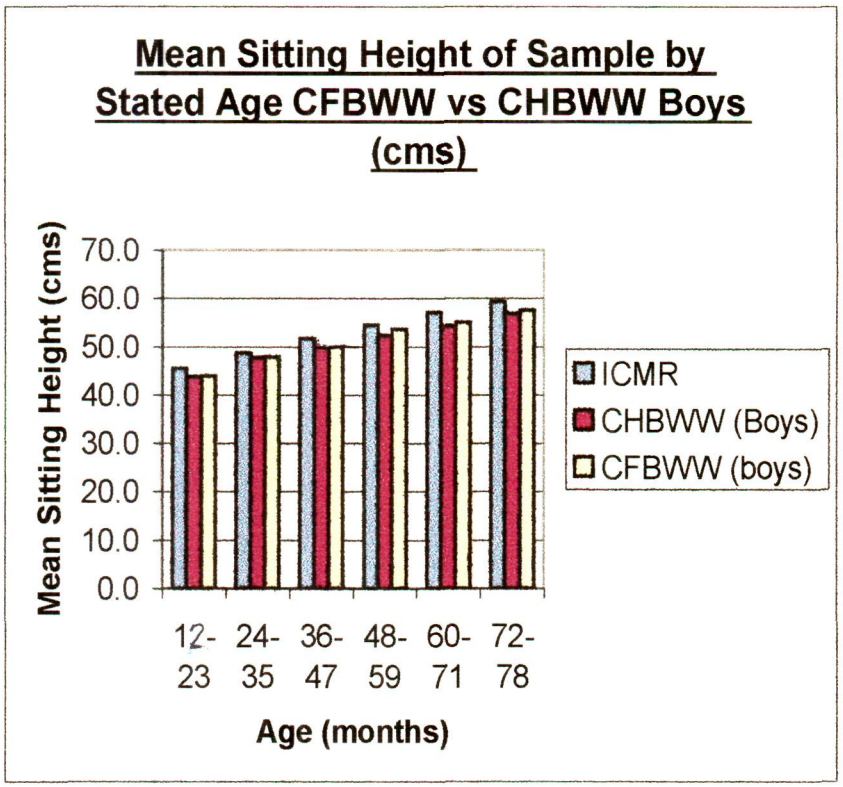


Fig.17

The boys in both the groups studied had sitting heights below the ICMR standards at all the ages. This was the case among the girls also. The children of factory based working women had marginally higher values for sitting height than children of home based workers. The mean sitting heights noted were below ICMR values.

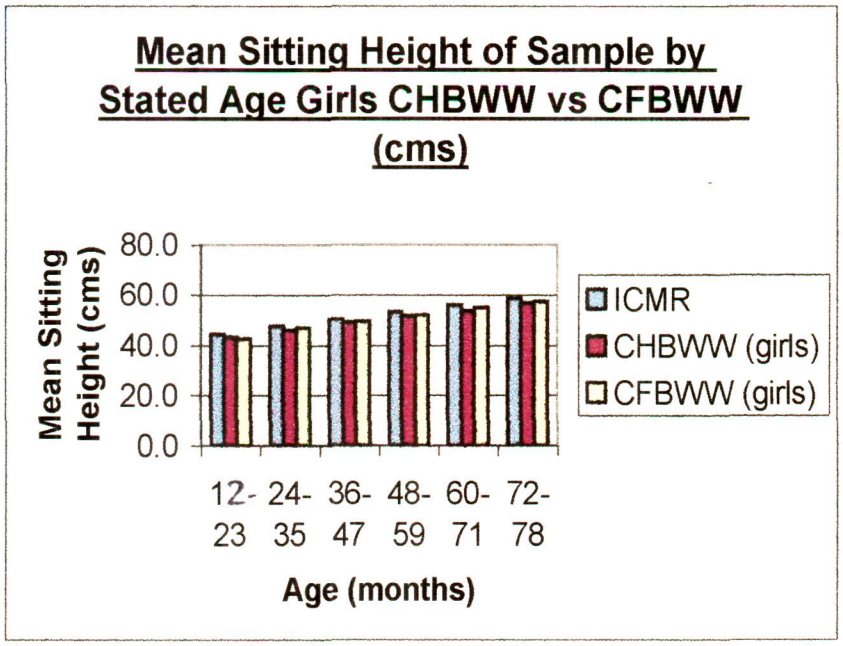


Fig.18

At the age of 36-47 months the girls of FBWW had sitting heights slightly higher than the ICMR values.

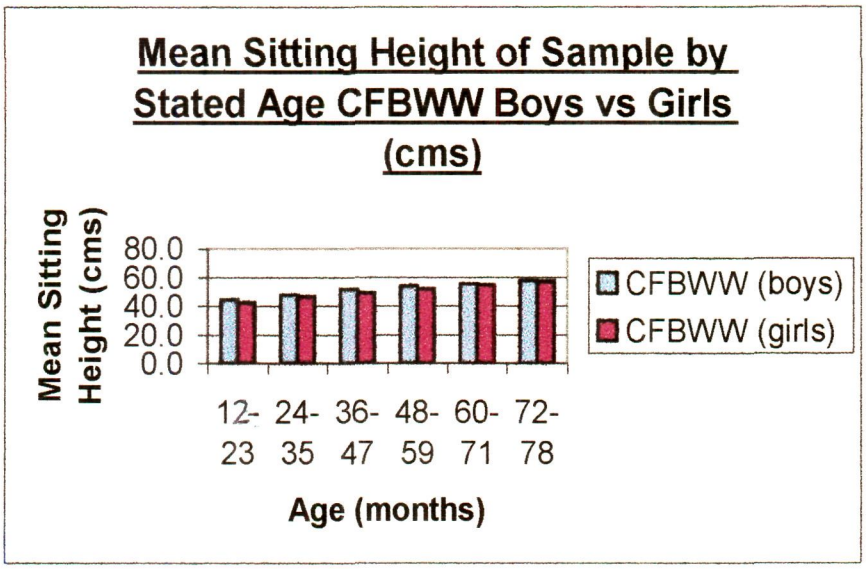


Fig.19

The differences in the mean sitting heights between the boys and the girls was seen to be more marked till the age of 5

years, after which there were only imperceptible differences. This was true of both the groups.

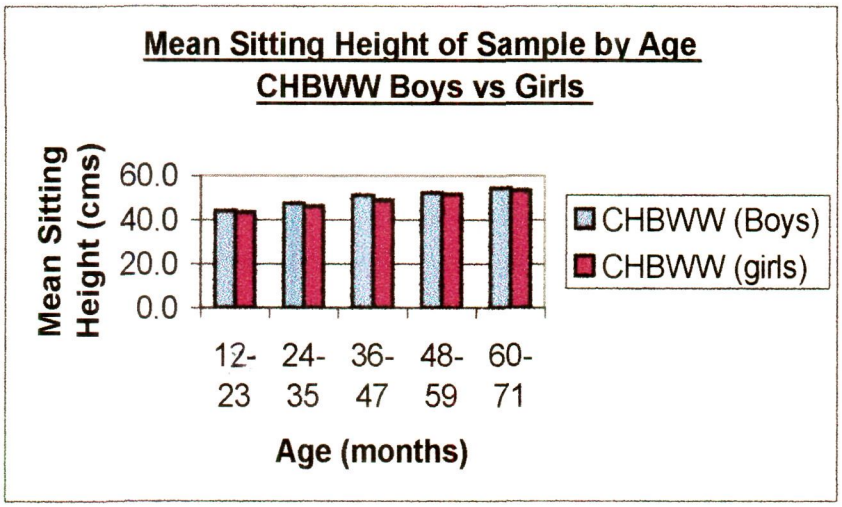


Fig.20

The differences in mean sitting heights between the children of home based working women was marginal but the boys consistently had a higher mean sitting height than the girls at each age interval.

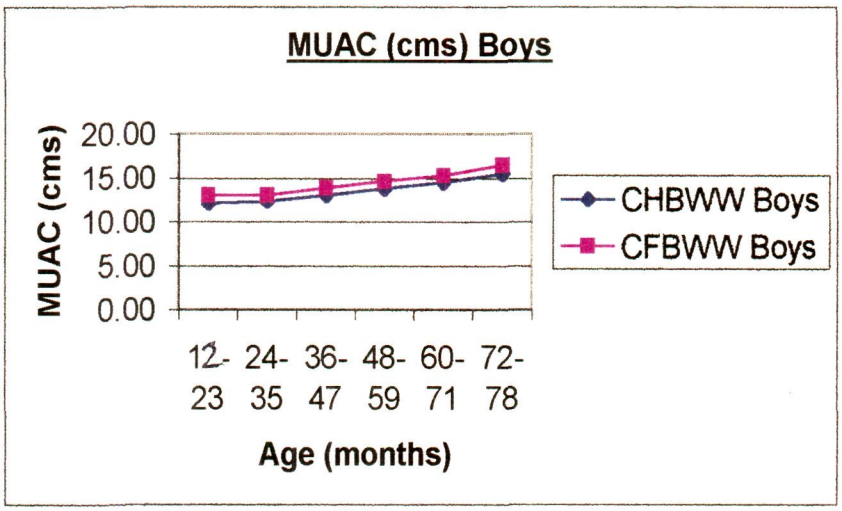


Fig.21

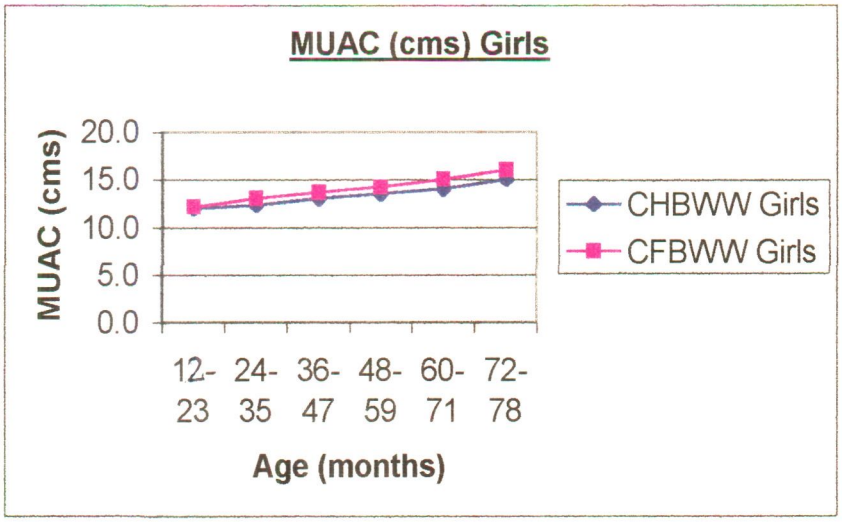


Fig.22

The mid upper arm circumference is an age independent measure and is specially useful in detecting P.E.M. among samples where exact age verification is not easy. Together with weight for height the MUAC constitutes a useful and practical means of assessing protein calorie deficiency (Jelliffe, 1983). From the findings of the present study, the MUAC of the children of FBWW was marginally better than the children of HBWW. However the MUAC of the boys of both the groups was higher than that of the girls. These results are in consonance with the views of Chaudhuri, 1975, Bakshi and Bhandari, 1977 and Srivastava, 1991. The MUAC is useful not only in identifying malnutrition but also in determining the mortality risk in children (Bamji, 1998).

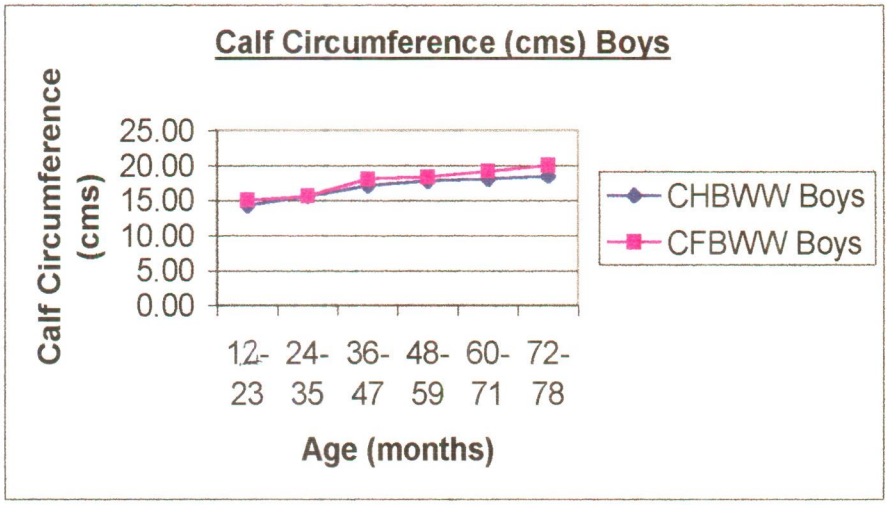


Fig.23

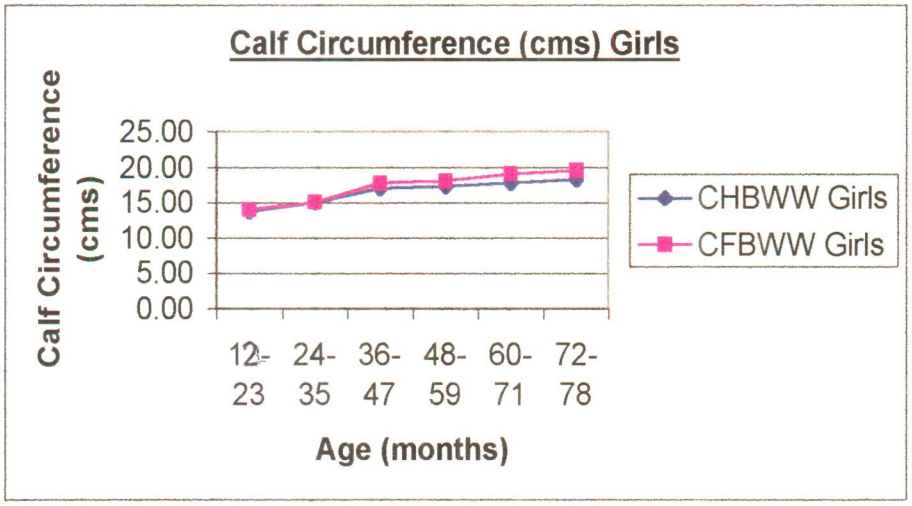


Fig.24

Calf circumference also indicated the status of muscle development. The calf circumference of both the sample groups is shown above. The children of factory based mothers show higher values.

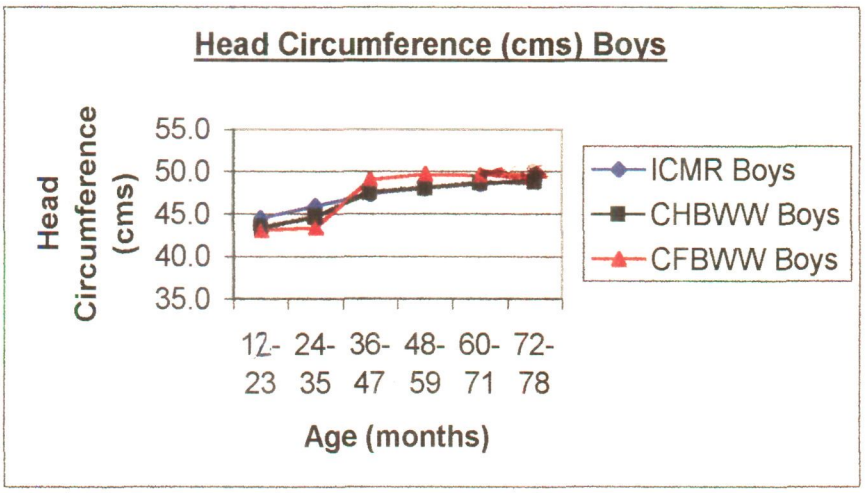


Fig.25

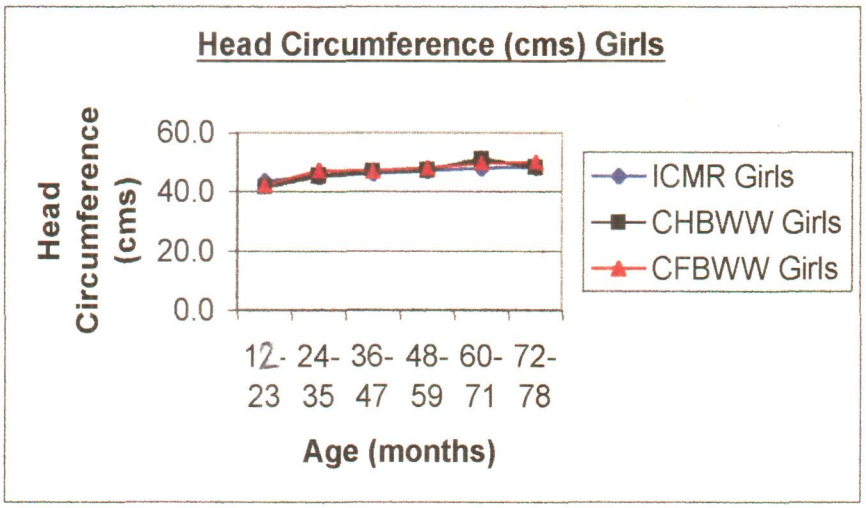


Fig.26

In the measurements of head circumference the boys recorded higher values than the girls at all age intervals in both the groups as can be seen from the above figures. In nutritional anthropometry the Kanavati Index is useful in detecting P.E.M. in young children. It is calculated by dividing the MUAC by the head circumference. Values of 0.32 and above are considered normal. Values between 0.28 and 0.32 signify mild malnutrition while values between 0.25

and 0.28 mean that the child is moderately malnourished and values below 0.25 denote severe under nutrition (Parthasarathy et al, 1999). In the study undertaken it was found that the children of home based working women, both boys and girls showed almost identical values at all age intervals except the 12-23 months where the girls were better than the boys.

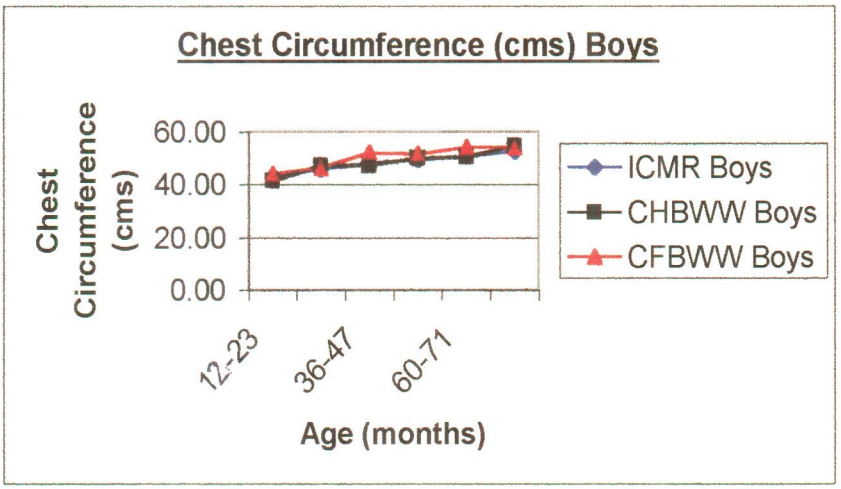


Fig.27

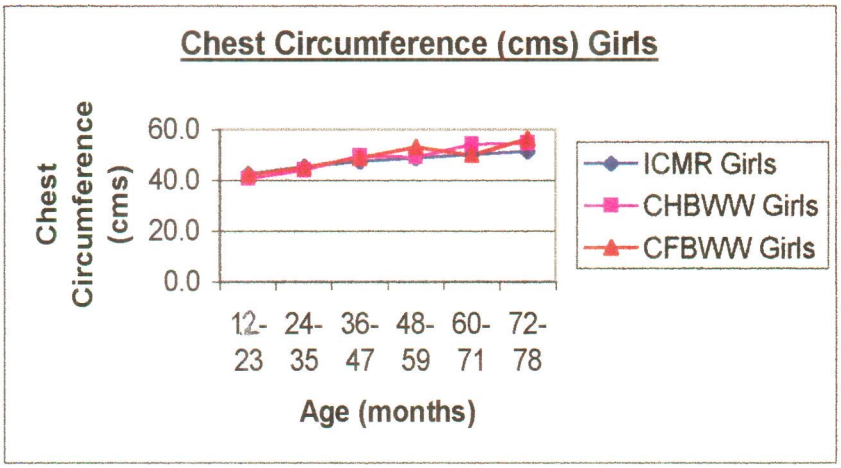


Fig.28

The mean chest circumference of CFBWW and CHBWW is shown in the figure. As in the case of head circumference, the chest circumference of the sons of factory-based mothers was found to be higher than the chest circumferences of the sons of home based mothers. The values were higher after the age of 36 months. The rise in values is gradual as shown in the figure above.

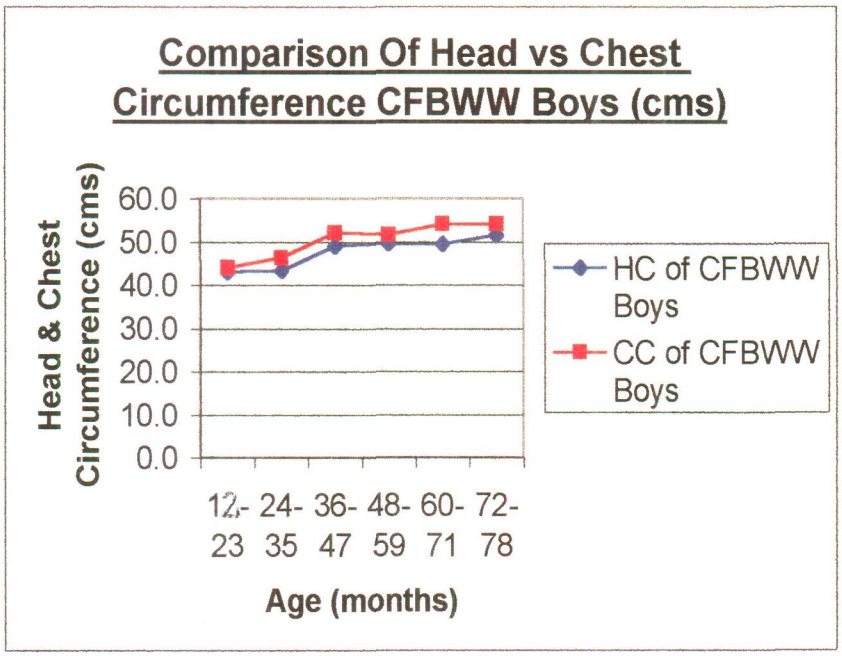


Fig.29

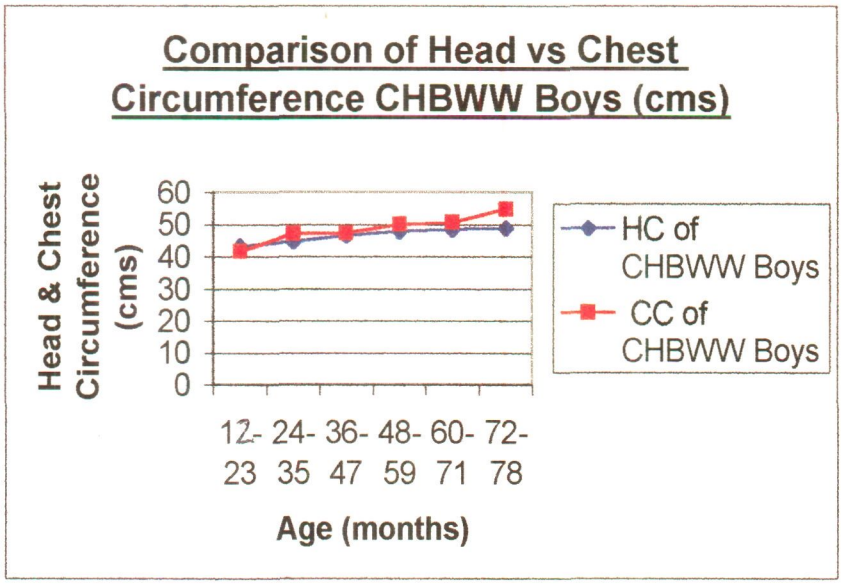


Fig.30

In the first year of life the head circumference reflects the age rather than health or nutritional status, but in normally growing children the chest circumference overtakes the head circumference at about two years of age. The chest/ head circumference of less than one between the ages of 1 and 5 may be indicative of PEM (Swaminathan, 1993). The chest head ratio of the sample studied are depicted above as can be seen there are more incidences of this value being less than one among boys and girls of the home based group.

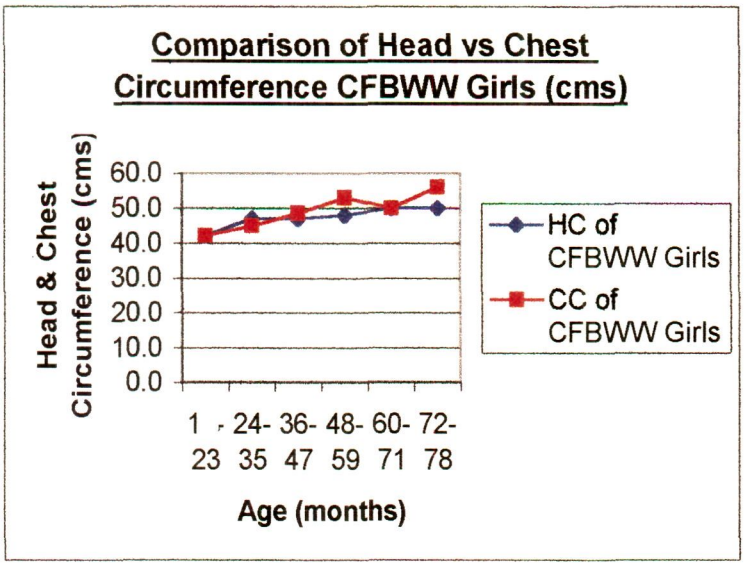
Comparison of Head vs Chest Circumference CFBWW Girls (cms)
Head & Chest Circumference (cms)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1 - 23
24- 35
36- 47
48- 59
60- 71
72- 78
Age (months)
HC of CFBWW Girls
CC of CFBWW Girls

Fig.31

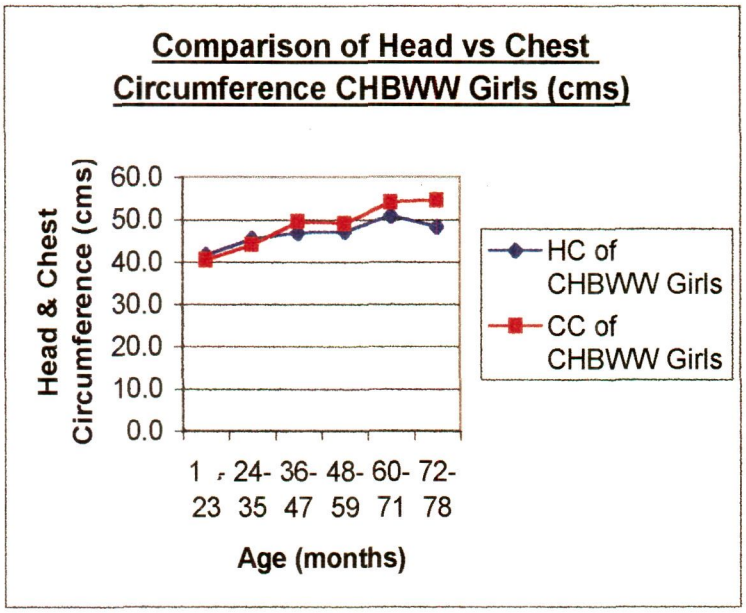
Comparison of Head vs Chest Circumference CHBWW Girls (cms)
Head & Chest Circumference (cms)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1 - 23
24- 35
36- 47
48- 59
60- 71
72- 78
Age (months)
HC of CHBWW Girls
CC of CHBWW Girls

Fig.32

| Age (months) | CHBWW Boys | CFBWW Boys | CFBWW Girls | CHBWW Girls |
|---|---|---|---|---|
| 12-23 | 0.27 | 0.30 | 0.28 | 0.28 |
| 24-35 | 0.27 | 0.29 | 0.28 | 0.27 |
| 36-47 | 0.27 | 0.29 | 0.29 | 0.28 |
| 48-59 | 0.28 | 0.30 | 0.30 | 0.28 |
| 60-71 | 0.29 | 0.31 | 0.31 | 0.29 |
| 72-78 | 0.31 | 0.33 | 0.33 | 0.31 |

***Table 5.5:*** The Kanavati Index

| Age (months) | CFBWW Boys | CHBWW Boys | CFBWW Girls | CHBWW Girls |
|---|---|---|---|---|
| 12-23 | 0.13 | 0.14 | 0.12 | 0.13 |
| 24-35 | 0.15 | 0.14 | 0.14 | 0.12 |
| 36-47 | 0.16 | 0.15 | 0.15 | 0.15 |
| 48-59 | 0.14 | 0.12 | 0.14 | 0.14 |
| 60-71 | 0.13 | 0.12 | 0.13 | 0.14 |
| 72-78 | 0.14 | 0.13 | 0.15 | 0.13 |

***Table 5.6:*** The Rao Index

| Age (months) | CFBWW Boys | CHBWW Boys | CFBWW Girls | CHBWW Girls |
|---|---|---|---|---|
| 12-23 | 0.09 | 0.09 | 0.08 | 0.08 |
| 24-35 | 0.12 | 0.10 | 0.11 | 0.09 |
| 36-47 | 0.14 | 0.13 | 0.13 | 0.13 |
| 48-59 | 0.13 | 0.12 | 0.13 | 0.12 |
| 60-71 | 0.13 | 0.12 | 0.13 | 0.14 |
| 72-78 | 0.15 | 0.14 | 0.15 | 0.14 |

***Table 5.7:*** The Quetlet's Index

The girls of the factory based group at the 24-35 months age interval also showed a value 0.95. A point to be noted was that at no age interval did the boys of the factory-based mothers' group show values less than one.

**Assessment of the Nutritional Status of the Children of the Sample:**

Nutritional status of the children of factory based working women and the children of the home based working women (earlier referred to as the non-working women) was assessed by anthropometry as the growth is one of the most sensitive indicators of the nutritional status of the young children (Devi and Geervani, 1998). This view is shared by Rao et al (1979), Gopalan and Chatterjee (1985), Gopalan (1995), Ghosh (1995) and Bamji (1988).

In general, the weight, height and arm circumference have now been recognized as the most sensitive and reliable parameters and the most practical for assessing the nutritional status of a population of young children.

In the research project undertaken, the Nutritional Status was assessed using the prevailing classifications – Gomez, Jelliffe, the more recent on recommended by the Indian Academy of Pediatrics and lastly the NCHS classification which is internationally accepted.

The Gomez classification was used to assess the different grades of malnutrition in the sample group. Though none of the boys from the factory-based group were in grade 3, only 3.44% of them were in the normal category. The majority of them were in the grades 1 and 2 of malnutrition, which together made up 96.55% of the factory-based sample. In the case of the girls the picture was different – once again proving the point that gender discrimination still exists – at least among the lower socio-economic strata. None of the girls of the factory based working women were in the normal category and 20.4% were in the severely malnourished grade 3. 42.85% were in the grade 2 while 30.61% were in grade 1.

| Age (months) | Normal | Grade 1 | Grade 2 | Grade 3 | Total |
|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 5 | 0 | 5 |
| 24-35 | 0 | 8 | 5 | 0 | 13 |
| 36-47 | 0 | 5 | 0 | 0 | 5 |
| 48-59 | 1 | 5 | 5 | 0 | 11 |
| 60-71 | 0 | 11 | 6 | 0 | 17 |
| 72-78 | 1 | 4 | 2 | 0 | 7 |
| **Total** | 2 | 33 | 23 | 0 | 58 |

***Table 5.8:*** Distribution of Sample CFBWW Boys according to Gomez's Classification.

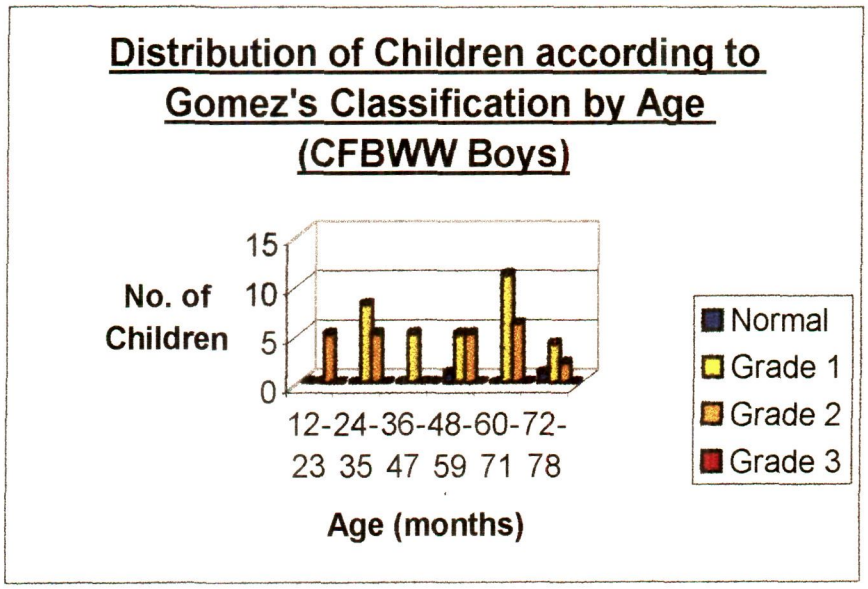


Fig.33

| Age (months) | Normal | Grade 1 | Grade 2 | Grade 3 | Total |
|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 21 | 4 | 25 |
| 24-35 | 0 | 0 | 7 | 6 | 13 |
| 36-47 | 0 | 10 | 7 | 0 | 17 |
| 48-59 | 0 | 6 | 12 | 0 | 18 |
| 60-71 | 0 | 5 | 10 | 3 | 18 |
| 72-78 | 5 | 12 | 8 | 0 | 25 |
| **Total** | 5 | 33 | 65 | 13 | 116 |

***Table 5.9:*** Distribution of Sample CHBWW Boys according to Gomez's classification.

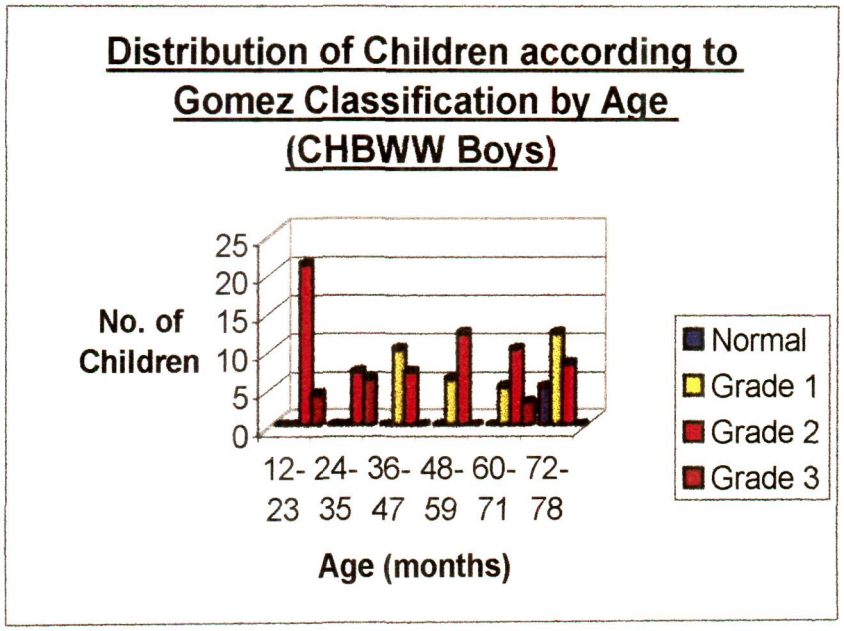


Fig.34

The home based group's sons were mostly in the grade 2 of malnutrition (56%), 28.44% in grade 1 and 11.2% in grade 3.

There were only 4.31% boys who were normal nutritionally. This is slightly better than the previous group.

| Age (months) | Normal | Grade 1 | Grade 2 | Grade 3 | Total |
|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 7 | 10 | 17 |
| 24-35 | 0 | 0 | 5 | 0 | 5 |
| 36-47 | 0 | 9 | 5 | 0 | 14 |
| 48-59 | 0 | 2 | 2 | 0 | 4 |
| 60-71 | 0 | 4 | 1 | 0 | 5 |
| 72-78 | 0 | 3 | 1 | 0 | 4 |
| **Total** | 0 | 15 | 21 | 10 | 49 |

***Table 5.10:*** Distribution of Sample CFBWW Girls according to Gomez's classification.

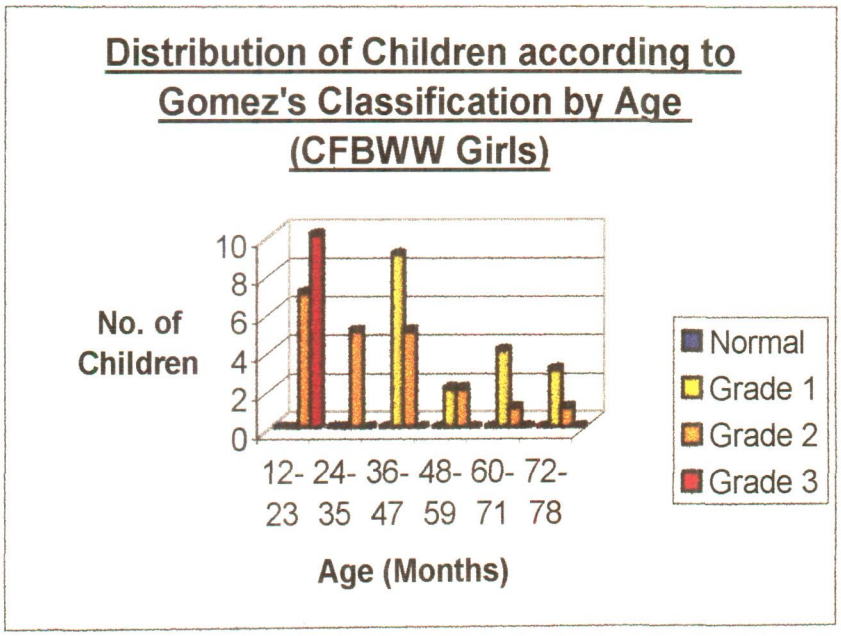


Fig.35

| Age (months) | Normal | Grade 1 | Grade 2 | Grade 3 | Total |
|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 8 | 16 | 24 |
| 24-35 | 0 | 0 | 0 | 8 | 8 |
| 36-47 | 0 | 5 | 7 | 0 | 12 |
| 48-59 | 0 | 3 | 14 | 4 | 21 |
| 60-71 | 0 | 5 | 4 | 0 | 9 |
| 72-78 | 3 | 9 | 11 | 0 | 23 |
| **Total** | 3 | 22 | 44 | 28 | 97 |

***Table 5.11:*** Distribution of Sample CHBWW Girls according to Gomez's classification.

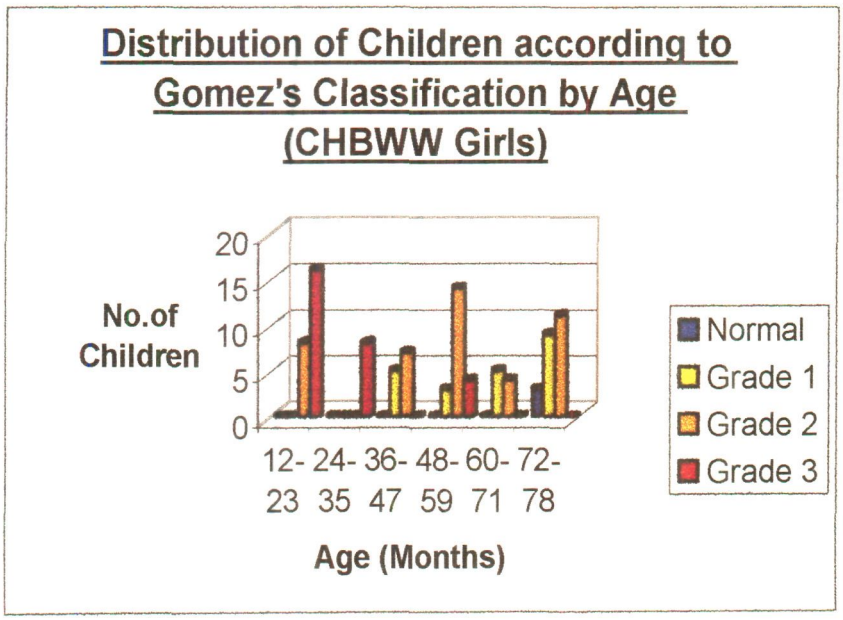


Fig.36

Among the girls only 3.09% were normal, 22.68% in grade 1, 45% in grade 2 and 28.8% in grade 3. In comparison the daughters of the factory-based mothers were of marginally

better nutritional status. Most of the girls in both the groups were severely malnourished in the 12-23 months age interval.

In Jelliffe's classification depicted in the figures above and below nutritional status was categorized into 4 grades as also the normal. This classification is based on the Harvard Standards.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 0 | 5 | 0 | 5 |
| 24-35 | 0 | 5 | 6 | 2 | 0 | 13 |
| 36-47 | 0 | 4 | 1 | 0 | 0 | 5 |
| 48-59 | 1 | 4 | 3 | 3 | 0 | 11 |
| 60-71 | 0 | 0 | 11 | 6 | 0 | 17 |
| 72-78 | 1 | 1 | 5 | 0 | 0 | 7 |
| **Total** | 2 | 14 | 26 | 16 | 0 | 58 |

***Table 5.12:*** Distribution of Sample CFBWW Boys according to Jelliffe's classification.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 4 | 17 | 4 | 25 |
| 24-35 | 0 | 0 | 0 | 7 | 6 | 13 |
| 36-47 | 0 | 8 | 6 | 3 | 0 | 17 |
| 48-59 | 0 | 3 | 11 | 4 | 0 | 18 |
| 60-71 | 0 | 2 | 7 | 6 | 3 | 18 |
| 72-78 | 5 | 9 | 6 | 5 | 0 | 25 |
| **Total** | 5 | 22 | 34 | 42 | 13 | 116 |

***Table 5.13:*** Distribution of Sample CHBWW Boys according to Jelliffe's classification.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 1 | 6 | 10 | 17 |
| 24-35 | 0 | 0 | 4 | 1 | 0 | 5 |
| 36-47 | 0 | 3 | 11 | 0 | 0 | 14 |
| 48-59 | 0 | 1 | 3 | 0 | 0 | 4 |
| 60-71 | 0 | 0 | 4 | 1 | 0 | 5 |
| 72-78 | 0 | 2 | 2 | 0 | 0 | 4 |
| **Total** | 0 | 6 | 25 | 8 | 10 | 49 |

***Table 5.14:*** Distribution of Sample CFBWW Girls according to Jelliffe's classification.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 0 | 8 | 16 | 24 |
| 24-35 | 0 | 0 | 0 | 0 | 8 | 8 |
| 36-47 | 0 | 3 | 3 | 6 | 0 | 12 |
| 48-59 | 0 | 1 | 10 | 6 | 4 | 21 |
| 60-71 | 0 | 3 | 2 | 4 | 0 | 9 |
| 72-78 | 3 | 3 | 17 | 0 | 0 | 23 |
| **Total** | 3 | 10 | 32 | 24 | 28 | 97 |

***Table 5.15:*** Distribution of Sample CHBWW Girls according to Jelliffe's classification.

In the children of factory based women workers the boys and girls were mostly in grade 2 of malnutrition. Like in the Gomez classification 20.4% of the girls were in grade 4 i.e. severely malnourished. There were no boys in this grade. Among children of home based working women there were no children till the age interval of 72-78 months who were in the normal category. At the same time it was also observed that a greater percentage of the (28.86%) girls were severely malnourished as compared to the boys, (11.2%), clearly pointing to the prevalence of gender discrimination.

The IAP classification was recommended by the Indian Academy of Pediatrics (Parthasarathy et al, 1999). It is a modification of the Gomez scale and is based on the Harvard standards.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 5 | 0 | 0 | 5 |
| 24-35 | 5 | 5 | 3 | 0 | 0 | 13 |
| 36-47 | 4 | 1 | 0 | 0 | 0 | 5 |
| 48-59 | 5 | 2 | 4 | 0 | 0 | 11 |
| 60-71 | 2 | 13 | 2 | 0 | 0 | 17 |
| 72-78 | 2 | 5 | 0 | 0 | 0 | 7 |
| **Total** | 18 | 26 | 14 | 0 | 0 | 58 |

***Table 5.16:*** Distribution of Sample CFBWW Boys according to IAP classification.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 3 | 18 | 4 | 0 | 25 |
| 24-35 | 0 | 0 | 0 | 7 | 6 | 13 |
| 36-47 | 7 | 7 | 3 | 0 | 0 | 17 |
| 48-59 | 2 | 11 | 5 | 0 | 0 | 18 |
| 60-71 | 2 | 6 | 7 | 3 | 0 | 18 |
| 72-78 | 14 | 6 | 5 | 0 | 0 | 25 |
| **Total** | 25 | 33 | 38 | 14 | 6 | 116 |

***Table 5.17:*** Distribution of Sample CHBWW Boys according to IAP classification.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 1 | 7 | 1 | 8 | 17 |
| 24-35 | 0 | 5 | 0 | 0 | 0 | 5 |
| 36-47 | 3 | 11 | 0 | 0 | 0 | 14 |
| 48-59 | 1 | 3 | 0 | 0 | 0 | 4 |
| 60-71 | 1 | 4 | 0 | 0 | 0 | 5 |
| 72-78 | 3 | 1 | 0 | 0 | 0 | 4 |
| **Total** | 8 | 25 | 7 | 1 | 8 | 49 |

***Table 5.18:*** Distribution of Sample CFBWW Girls according to IAP classification.

| Age (months) | Normal | Grade1 | Grade2 | Grade3 | Grade4 | Total |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 10 | 8 | 6 | 24 |
| 24-35 | 0 | 0 | 0 | 8 | 0 | 8 |
| 36-47 | 4 | 3 | 5 | 0 | 0 | 12 |
| 48-59 | 1 | 10 | 6 | 4 | 0 | 21 |
| 60-71 | 3 | 2 | 4 | 0 | 0 | 9 |
| 72-78 | 11 | 12 | 0 | 0 | 0 | 23 |
| **Total** | 19 | 27 | 25 | 20 | 6 | 97 |

***Table 5.19:*** Distribution of Sample CHBWW Girls according to IAP classification.

According to this classification a larger percentage of children were in the normal range especially after the age of 3 years in both the sample groups. Among the home based children the boys and girls were mostly in grade 1 and 2 of malnutrition. A larger percentage of boys were in the normal category (21.55%) than the girls (19.58%).

Among the girls, the maximum number who were severely malnourished were in the age interval of 12-23 months whereas among the boys the severely malnourished were at the 24-35 month interval. The actual percentage of boys who were in grade 4 was 5.17% and of girls 6.18%.

The results among the children of the factory based working women pointed to the fact that there were no boys in grade 3 or grade 4 of malnutrition while there were 18.36% of girls in the same grades. Here again the severely malnourished girls belonged to the 12-23 month age interval

The classification of the National Center of Health Statistics (NCHS) does not differ significantly from the Harvard standards in use earlier as far as the under fives are concerned (Gopalan, 1995). In the NCHS classification the cutoff points for defining malnutrition are as given below.

| Indices | Nomenclature for Deficit of Index | Cut Off Points % of Reference Median |
|---|---|---|
| **Weight for Height** | Wasting | <80 |
| **Height for Age** | Stunting | <90 |
| **Weight for Age** | Underweight | <80 |
| | Severe underweight | <60 |

According to the above classification which is the currently accepted international classification of malnutrition based on NCHS Standards it was found that 34.48% of the sons of factory based working women were underweight while a similar percentage were stunted. 8.62% were wasted and 15.51% were stunted and wasted. Only 6.89% were normal. Among the girls only 4.08% were normal while 42.85% were stunted, 18.36% were underweight, 10.20% were wasted and 24.48% were stunted and wasted as can be clearly seen.

| Age (months) | NORMAL | UNDER WEIGHT | STUNTED | WASTED | STUNTED & WASTED | TOTAL |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 0 | 1 | 4 | 5 |
| 24-35 | 3 | 5 | 5 | 0 | 0 | 13 |
| 36-47 | 0 | 0 | 5 | 0 | 0 | 5 |
| 48-59 | 1 | 1 | 9 | 0 | 0 | 11 |
| 60-71 | 0 | 8 | 0 | 4 | 5 | 17 |
| 72-78 | 0 | 6 | 1 | 0 | 0 | 7 |
| **Total** | 4 | 20 | 20 | 5 | 9 | 58 |

***Table 5.20:*** Distribution of Sample CFBWW Boys according to NCHS classification.

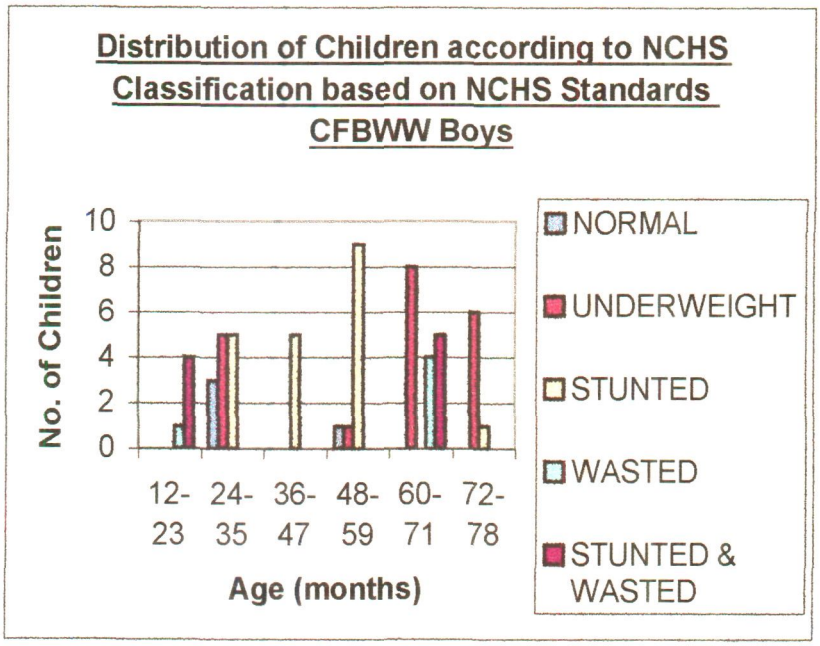


Fig.37

| Age (months) | NORMAL | UNDER WEIGHT | STUNTED | WASTED | STUNTED & WASTED | TOTAL |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 14 | 4 | 7 | 25 |
| 24-35 | 0 | 0 | 5 | 0 | 8 | 13 |
| 36-47 | 0 | 8 | 9 | 0 | 0 | 17 |
| 48-59 | 0 | 0 | 5 | 11 | 2 | 18 |
| 60-71 | 0 | 0 | 11 | 2 | 5 | 18 |
| 72-78 | 8 | 5 | 7 | 0 | 5 | 25 |
| **Total** | 8 | 13 | 51 | 17 | 27 | 116 |

***Table 5.21:*** Distribution of Sample CHBWW Boys according to NCHS classification.

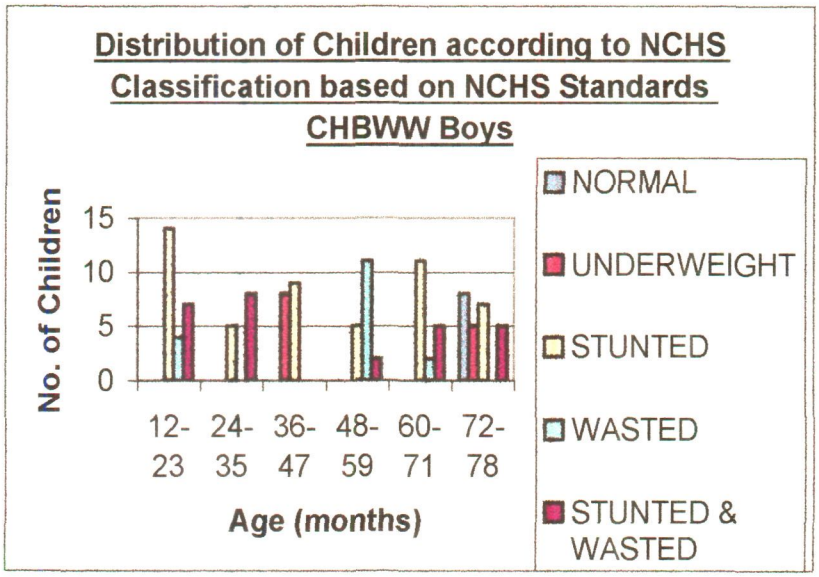


Fig.38

| Age (months) | NORMAL | UNDER WEIGHT | STUNTED | WASTED | STUNTED & WASTED | TOTAL |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 0 | 5 | 12 | 17 |
| 24-35 | 0 | 2 | 3 | 0 | 0 | 5 |
| 36-47 | 2 | 4 | 8 | 0 | 0 | 14 |
| 48-59 | 0 | 0 | 4 | 0 | 0 | 4 |
| 60-71 | 0 | 3 | 2 | 0 | 0 | 5 |
| 72-78 | 0 | 0 | 4 | 0 | 0 | 4 |
| **Total** | 2 | 9 | 21 | 5 | 12 | 49 |

***Table 5.22:*** Distribution of Sample CFBWW Girls according to NCHS classification.

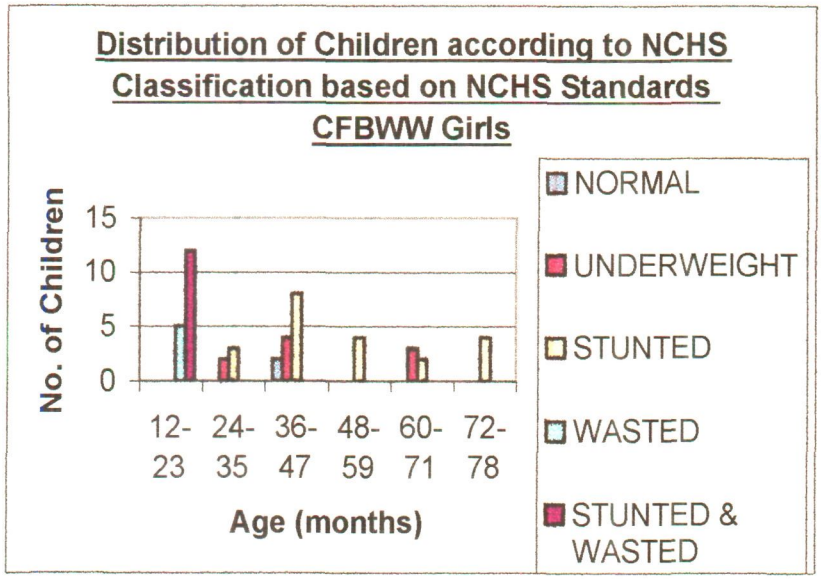


Fig.39

| Age (months) | NORMAL | UNDER WEIGHT | STUNTED | WASTED | STUNTED & WASTED | TOTAL |
|---|---|---|---|---|---|---|
| 12-23 | 0 | 0 | 8 | 4 | 12 | 24 |
| 24-35 | 0 | 0 | 0 | 0 | 8 | 8 |
| 36-47 | 0 | 0 | 8 | 4 | 0 | 12 |
| 48-59 | 0 | 4 | 16 | 0 | 1 | 21 |
| 60-71 | 2 | 1 | 6 | 0 | 0 | 9 |
| 72-78 | 4 | 7 | 8 | 4 | 0 | 23 |
| **Total** | 6 | 12 | 46 | 12 | 21 | 97 |

***Table 5.23:*** Distribution of Sample CHBWW Girls according to NCHS classification.

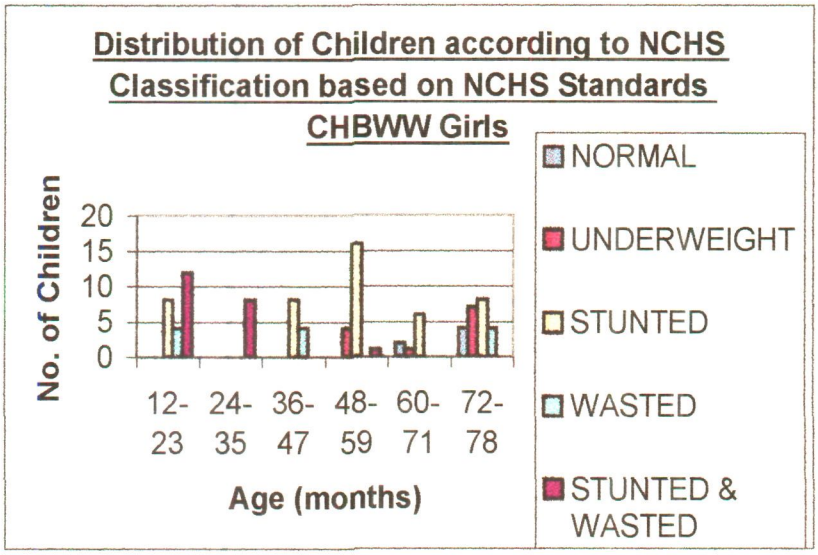


Fig.40

The condition of children of the home-based mothers was marginally different. 6.89% of the sons came under the normal category as compared to the 6.18% of the daughters. 11.2% of the boys were underweight as against 12.37% of the girls. 43.96% of the boys were stunted as against 47.42% of the girls. In the wasted category there were 14.65% boys and 12.37% girls and among the stunted and wasted category there were 23.27% boys and 21.64% girls.

In general it was seen that in almost all the cases the boys were better off than the girls. The difference between the nutritional statuses was not significant.

The Hypothesis is that "There is no significant difference between the nutritional status of the CFBWW and the CHBWW".

The t-test for difference of means has been used to statistically analyze the differences between the nutritional status of the children from both the groups surveyed.

| Age (months) | Height (cms) | t'-ratio | Hypothesis |
|---|---|---|---|
| **12-23** | | | |
| | 60-64.9 | 8.78 | # |
| | 65-69.9 | 5.71 | # |
| | 70-74.9 | 0.00 | * |
| **24-35** | | | |
| | 70-74.9 | -16.50 | # |
| **36-47** | | | |
| | 75-79.9 | -4.70 | # |
| | 80-84.9 | -2.06 | * |
| | 85-89.9 | -0.44 | * |
| | 90-94.9 | -0.48 | * |
| **48-59** | | | |
| | 90-94.9 | 1.39 | * |
| | 95-99.9 | -8.97 | # |
| **60-71** | | | |
| | 100-104.9 | 0.81 | * |
| **72-78** | | | |
| | 95-99.9 | 1.38 | * |
| | 100-104.9 | -3.94 | # |

# denotes False values for the Hypothesis

* denotes True values for the Hypothesis

The t-test indicates that there are significant differences between the nutritional status up to the age of 3 years after which the nutritional status of the two groups equalizes.

Using the $Chi^2$ test, the hypothesis that the presence of the mother significantly affects the nutritional status of the child has been found to be false.

**Clinical Symptoms and Nutrient Intake:**

The clinical manifestations of dietary inadequacies usually appear at a much later stage of malnutrition. Clinical observations are the least sensitive approach to assess nutritional status (Guthrie, 1979). This view is also shared by Swaminathan (1993), who goes on to say, that some clinical symptoms have no relation to dietary deficiencies. The lack of reliability of such observations of clinical symptoms is also due to a certain bias of the observer. This could be a source of error. Hence, not much importance was given to clinical observations of the sample studied except the ones, which could be seen very clearly.

| Clinical Symptoms | Boys | Normal Boys | Girls | Normal Girls |
|---|---|---|---|---|
| Dyspigmented Hair | 34 | 24 | 35 | 14 |
| Pale Conjunctiva | 15 | 43 | 29 | 20 |
| Skin Problems | 25 | 33 | 38 | 11 |
| Pot Belly | 12 | 46 | 17 | 32 |
| No Visible Signs | | 24 | | 11 |

***Table 5.24:*** Distribution of Sample CFBWW according to clinical symptoms of malnutrition.

| Clinical Symptoms | Boys | Normal Boys | Girls | Normal Girls |
|---|---|---|---|---|
| Dyspigmented Hair | 80 | 36 | 65 | 32 |
| Pale Conjunctiva | 83 | 33 | 73 | 24 |
| Skin Problems | 45 | 71 | 37 | 60 |
| Pot Belly | 34 | 82 | 43 | 54 |
| No Visible Signs | | 33 | | 24 |

***Table 5.25:*** Distribution of Sample CHBWW according to clinical symptoms of malnutrition.

Most of the children observed had dyspigmented hair and skin problems. There were many cases of pale conjunctiva and pot belly also. Among children of factory based mothers 41.37% of the boys showed no visible signs of deficiency as against 22.44% of the girls. Collectively 32.71% of the children showed no clear clinical symptoms. Among the home based mothers group – the children who showed no visible clinical symptoms were 19.24% (19.82% boys and 18.55% girls).

As the sample studied belonged to the lowest economic strata they exhibited a complete disregard for personal hygiene and environmental sanitation. This made it difficult to observe clinical symptoms of deficiencies of nutrients clearly. The child was more often than not, dirty and unwashed, hair unkempt, nails dirty and barefoot.

Their dietary intake was predominantly carbohydrate. The source of proteins was also the roti sometimes with tea, with chutney or plain salt. In most of the homes of the sample studied 'atta' was bought everyday. When there was money available, dal or potatoes were also bought. The other items consumed occasionally included meat and eggs and green leafy vegetables like palak (spinach) or methi (fenugreek). When fruit was very cheap, banana and guava was also bought.

The food availability within the families was open to conjecture. Men and boys were always given preference regarding food distribution. Women and girls were the last to eat. As one respondent proudly mentioned, they bought milk everyday and on being asked whether it was distributed among the children – the women replied – no, of course not – the husband drinks it!

The findings regarding the nutrient intake of the present study was in agreement with the studies of Grewal et al (1973), Wallia and Gambhir (1975), Hassan and Ahmad (1984), and Devi and Geervani (1998). Calorie inadequacy limits child growth. In Devi and Geervani's study it was found that only 4.27% of the children consumed diets, which were adequate. The 1999 UNICEF Report states that malnutrition is the cause of more than half of all the child deaths in developing countries. Dietary inadequacy over a long period leads to repeated episodes of illness. These result in stunting and are most damaging in the first two

years of life. Stunted children may also suffer from reduced cognitive development and hearing disabilities. The long-term consequence is diminished work capacity resulting in low paid jobs, poverty which again results in inadequate dietary intake. It is a vicious cycle as depicted in the National Nutrition Policy of the Government of India, 1993. The National Nutrition Monitoring Bureau (1997) has repeatedly confirmed in successive surveys that it is the calorie inadequacy of the lowest segments of Indian society, which is responsible for the lack of growth and development of children.

## Factors related to the Mother

There are many factors related to the mother, which influence the health and nutritional status of children. The two groups studied – of working and non working mothers – the factory based and the home based, belonged to the lower income group. Being a part of the unorganized sector, they do not have the security of a regular income on which to support a family. Hence the mother's economically productive work pattern and her nutritional awareness play decisive roles in the health of her children. These important factors have been discussed below.

**Employment and Work Pattern:**

In recent years considerable attention has been paid to identifying and imputing value to women's unpaid domestic work in the household, but until very recently, hardly any research was undertaken on women's home based productive work for cash income. This is paradoxical because it is now known that the income derived from this work is often the very basis for family survival, more so, among the extremely poor (Singh and Viitanen, 1987). This is in complete accordance with the findings of the present study.

As has been stated previously, few accurate statistics exist on the number of women engaged in home based production due to lack of recognition of home based producers as workers in most national data gathering systems. This is the reason why the term 'non-working' has been used, and this is the reason why these women are 'invisible'. Home based or piece rate labour had certain common features – low wages, erratic working hours, fragmentation of the work force and the absence of any workers union or organization. In the locales of this study, the culture and the lifestyles of these women also isolate and segregate them from one another. Very rarely do they get together to air common grievances. Home based workers have yet to capture the attention of the policy makers and the planners due to the under valuation and invisibility of their work.

The factory-based women in this study also belong to the unorganized sector but would be considered 'working' because their work involves going away from home to a different environment for a few hours. They share the common features of the home based workers in that they are paid low wages, flexible working hours and the absence of unions. For them the advantage is of getting away from household drudgery and the harsh realities of life for a few hours. They ask no more.

The benefits of home based work as opposed to factory based work are, that the women can control and plan their working hours and adjust their daily tasks accordingly. Moreover there was no compromising on their cultural values. Most of the women felt that they should not go out of their homes for work even if wages were low. Where husbands existed and played a positive role, the home-based workers proudly stated that he would not allow them to interact with strangers in factory environs. As the women were confined to their homes, they did not know anything much about the subcontractor, the one who brought them their raw material except perhaps his name. This finding is in agreement with the study by Rao and Hussain (1987).

The work schedule of the home-based worker was crammed. Poverty and the urgent need to earn more to satisfy the needs of her family forced the woman to work long hours. Older children both boys and girls, often pitched in to help either with the housework or at the hand press. Thus in most

of the families, the women were not the only one in the income generating activity. Among the findings it was seen that mothers were unable to care for the young ones as required. The very young was usually carried while attending to other work. Once the child was mobile, not much attention was given to it. It ate whatever was available, when hungry and was often left to its own devices. Nobody had time to lavish on the child.

The factory-based mother occasionally took the child to the workplace but this was often the exception rather than the rule. The child, when it was left at home was at the mercy of the not much older sibling, usually a sister. She took care as well as she knew. Homes were usually near the factories. Hence the mother usually made a couple of trips to ensure that everything was fine.

| Age (years) | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| 18-25 | 25 | 16.77 | 9 | 14.28 |
| 26-33 | 66 | 44.29 | 21 | 33.33 |
| 34-41 | 54 | 36.26 | 31 | 49.22 |
| 42 and above | 4 | 2.68 | 2 | 3.17 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 5.26:*** Distribution of Sample by Work Pattern and Stated Age.

The lives of the working women were distressingly alike. They lived from day to day but hoped to have the security of their own house one day. They did not have much hope in

educating their children. Most of the women workers felt that sooner the child started earning the better.

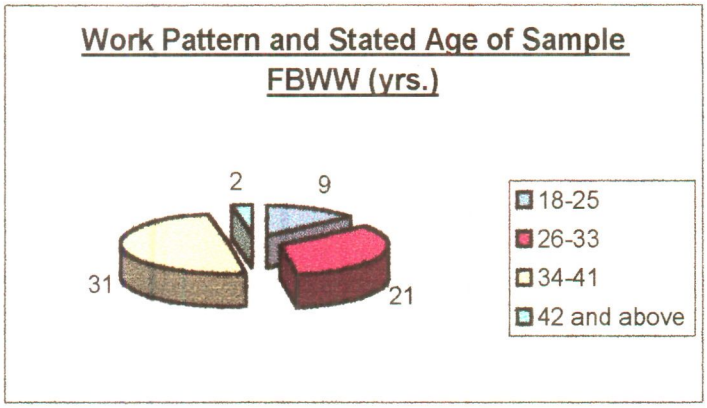


Fig.41

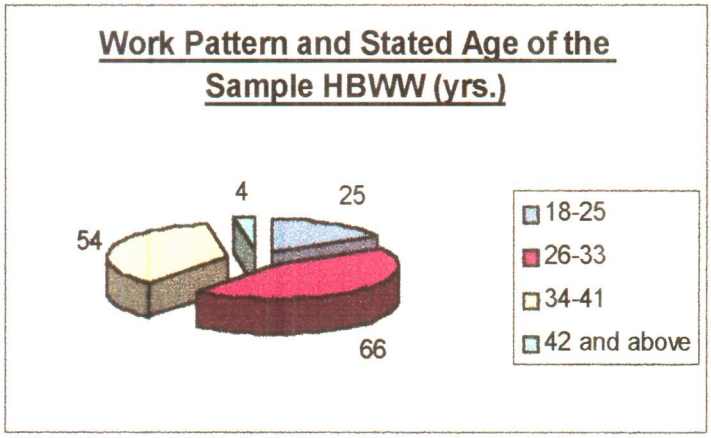


Fig.42

It was found that most of the factory based women workers were in the 34-41 year age group (49.20%) 33.33% were in the age group 26-33 years, 14.28% were in the 18-25 year group and only 3.17% were 42 years and above.

In the home-based group 44.29% were in the age group 26-33 years. The women of this age group constituted the

majority. It was closely followed by the 34-41 year age group (36.24%) 16.77% of the sample was between the ages of 18-25 years while there were only 2.68% of workers above 42 years.

The majority of the FBWW were an older age group as compared to the HBWW though there were very few workers above the age of 42. Two interpretations are possible – one that the age assessment of the workers was not accurate or that women cannot bear the double burden of such intense work schedules and they fall ill and are unable to continue working.

The nutritional status of the children of women who work in factories and the children of home based workers was assessed and compared. Among the sons of factory based mothers it was found that though there was a greater percentage (34.48%) of boys who were underweight there were lesser percentages of those who were wasted and stunted (15.51%) as compared to (23.27%) among the home based.

Among the daughters of factory based mothers there was a lesser percentage of normal children 4.08% as compared to 6.18% of the home based group. There were a greater percentage of wasted and stunted girls among the factory-based group 24.48%.

On the whole the factory based group was assessed to be marginally better than the home based group but one fact stood out – the boys had much better nutritional status than the girls in both the groups. In a study by Wray and Aguirre (1969) it had been found that the nutritional status of the children of mothers who worked full time was better than those whose mothers worked part time. It goes on to say that that was so because mothers who worked full time were able to make better arrangements for the care of the child. Contrary to this, in a study by Gopaldas (1983) in Madhya Pradesh, it was found that the mothers of most malnourished groups of children were all working outside the home.

In the present study conducted in Aligarh city, it was found that children were not given much importance among the lower strata of society. One child more or less did not seem to matter – there were so many of them. As one mother put it when asked about the number of her children – "Nire" that is to say many.

**Nutritional Awareness:**

The nutritional awareness of the mother was expected to play a major role on the health and nutritional status of the child. Women in all societies are involved in food production, cooking and distribution. They are also in charge of their own as well as their family's nutrition but despite this, they are controlled by social and cultural values.

The mothers who worked in factories had knowledge of more varieties of food but were able to buy only what they could afford. The home-based mothers knew of lesser varieties of food items. Like the study in Gujrat by Seshadri (1994) women did not connect their health condition to any dietary inadequacy. Most of the mothers knew that milk and eggs were strengthening but they did not know that energy and protein rich foods were essential for their growing children, mothers of well nourished children were as ignorant about essential facts on nutrition as the mothers of undernourished children in both groups studied. It was noted that during Ramzan the fat intake as well as the fruit intake showed a noticeable increase. A large percentage of the mothers were illiterate. Most of them felt that if a child were fed constantly it would be healthy. This finding is similar to the finding of Srivastava (1991). Most of the families had a hand to mouth existence. After the period of breast feeding the child was switched to the adult diet. This view is supported by Cowan and Dhanoa (1983) in a study in Ludhiana. The poor everywhere are alike in their poverty. This finding is again in agreement that income and nutritional awareness arte strongly related. The more income there is the quantity and quality of the food bought is higher.

**Marital Status:**

Another aspect regarding the women workers was their marital status. The majority of factory based working women were married and living with their husbands 76.19% as

compared to 65.77% of the home based working women. See figure.

| | HBWW | (%) | FBWW | (%) |
|---|---|---|---|---|
| **Unmarried** | 0 | 0.00 | 0 | 0.00 |
| **Married** | 98 | 65.78 | 48 | 76.19 |
| **Divorced/Separated** | 37 | 24.83 | 5 | 7.94 |
| **Widowed** | 14 | 9.39 | 10 | 15.87 |
| **Total** | 149 | 100.00 | 63 | 100.00 |

***Table 5.27:*** Distribution of Sample by Marital Status.

A point to be noted was that a comparatively larger percentage of home based women (24.83%) were either divorced or separated from their husbands thus reinforcing the view that the women's income was vital for the survival of the family. Only 7.93% of the factory based group fell into this category.

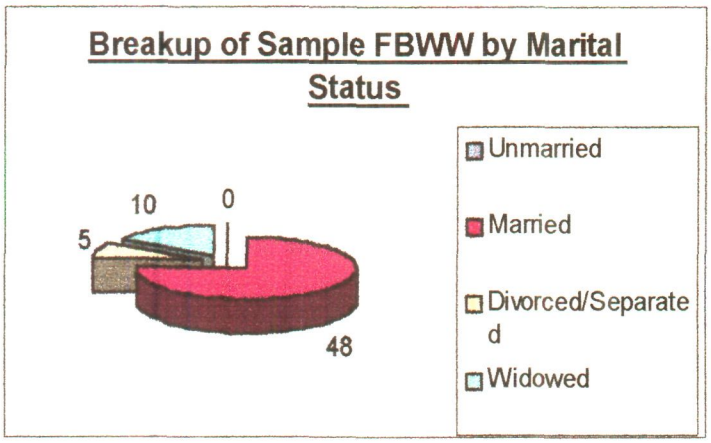


Fig.43

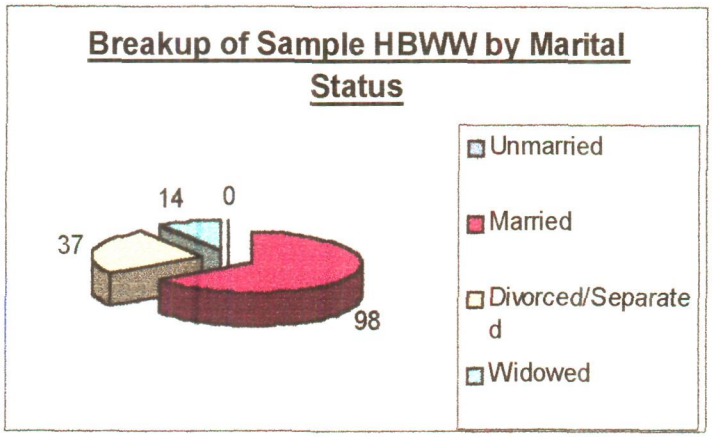


Fig.44

There were 9.39% widows in the home base group but in the factory-based group- there were 15.87% widows. In effect 23.80% of the factory based women workers had no husband as compared to 34.22% of the home based group.

## Other Factors

### Environmental Factors

There have been a number of studies on the role of various factors which affect the nutritional status of the pre-school child. Complex forces interact with poverty and ignorance to form a vicious cycle. Women and the very young children, especially girls, are caught in this 'chakravyuha' and tremendous efforts will have to be made by the governmental and non-governmental agencies to help them break free. Some of these factors have been dealt with in this present study.

Any destruction of the environment has a direct impact on the lives of the women and their children. This is related to the unequal division of labour among men and women. Any woman who takes up any job, which is remunerative inside or outside her home has a double work burden. She is responsible for housework and child care also. A major portion of her time is spent in fetching water and collecting fuel. If there are animals fodder has also to be arranged for. All these tasks are over and above her income generating work. In a study in western Uttar Pradesh, it was found that even pregnant women spent more than 12 hours on basic household activities (Agarwal, 1985). It is thus not surprising that weak sickly children are born to malnourished mothers.

In this study conducted in Aligarh, it was found that potable water was easily available to only 54.36% of the home based sample. This was because these families had the use of personal hand pump. Municipal water facilities had not reached every home. The majority of the home-based workers had to fetch the water from a common tap where the water supply was irregular. A larger percentage of the women of the factory-based group had easier access to potable water (68.25%).

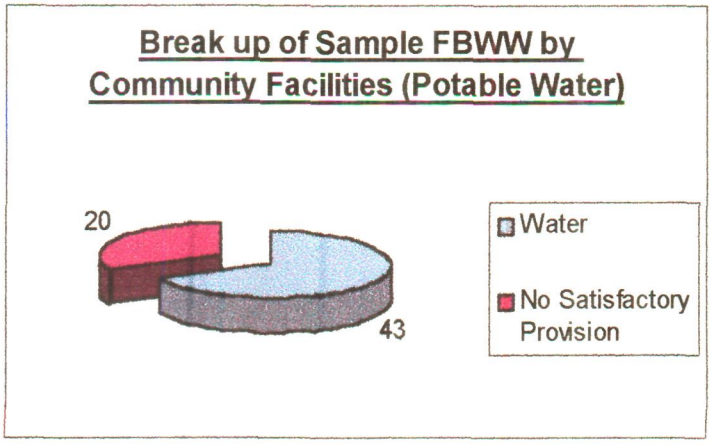


Fig.45

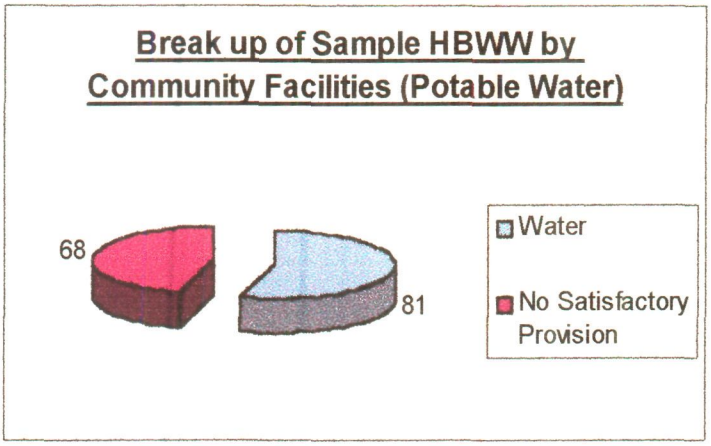


Fig.46

As regards toilet facilities, 62.41% of home-based workers had no provision for toilets. They answered the calls of nature early in the morning before sunrise in the fields nearby in Jeevangarh or in the vacant lots in Mushtaqnagar and similar uninhabited areas in Mahendranar and Chandaniya. For children, it was much easier – they used the drains outside the houses. The concept of maintaining a healthy physical environment just did not exist. Just as for water facilities a greater percentage of factory-based

workers lived in homes, which had toilets. Septic tanks were being built in the newer houses especially in Mushtaqnagar, but manual collection of human excreta was still being practiced in Chandaniya and Jeevangarh.

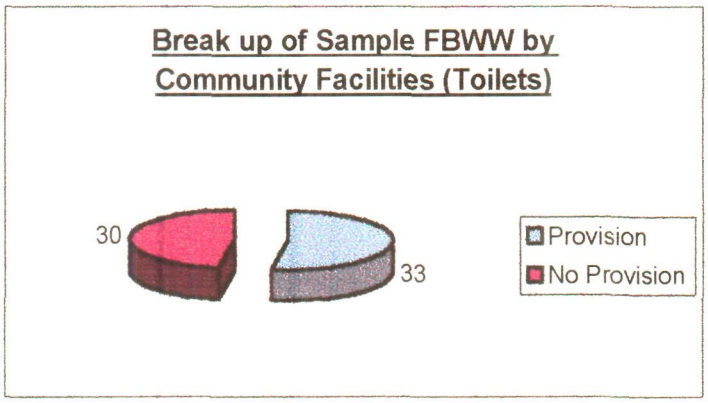


Fig.47

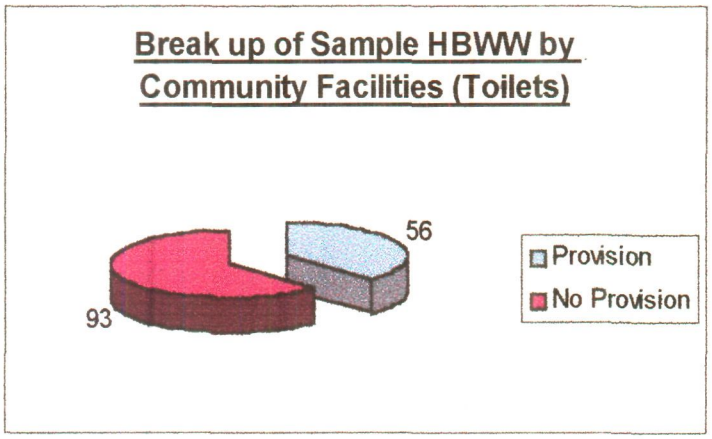


Fig.48

Generally, people did not relate good health to a clean environment. The drains were usually choked with rubbish and plastic bags. Except in the summer season, the nails were full of stagnant and dirty water. Very often, the children

to be weighed and measured were playing around these drains, clutching a Rusk or a biscuit. Occasionally the biscuit fell on the ground from where it was picked up and eaten. The child was usually tagging along with a not much older sibling while the mother was busy at the hand press making metal caps for mini bulbs. Mahadevan (1990) points out that if women from the lower strata are over burdened with house work and the like they will gradually not be able to render effective childcare and the pre-school children will be the worst sufferers as they are most vulnerable.

Lighting provisions and waste disposal also form constituents of a healthy environment. Most of the factories visited were ill lit and ill ventilated. The home environment of the workers was not much better. The only difference was that in the home the work was normally carried out in the verandah or the 'aangan' where the mother could keep an eye on the house and the children. Electricity cuts were a common feature in all parts of Aligarh, more so in the summer months. Most of the women complained of eyestrain.

Waste disposal was not carried out on a regular basis. Rotting waste was found in piles in front of most houses though the insides of the houses were comparatively clean. The entire environment was an ideal breeding ground for flies and mosquitoes. The children were oblivious of the flies wandering over their bodies.

During one visit just after a heavy down pour the researcher came across a bunch of children guiding paper boats with sticks on the flowing water in the drains. The local Halwai, the sweet meat seller, was frying hot samosas and selling them to an eager heterogeneous crowd. His portable shop was positioned over an open drain.

The nutritional status of the children cannot be improved just by increasing the quality and quantity of food eaten but also by improving the overall environment and thus the living standards. Devi and Geervani have expressed a similar view in a study in Andhra Pradesh in 1998.

**Type of Family:**

The majority of women workers both home based and factory based lived in nuclear families – 76.5% and 71.42% as can be seen in figures and . It was found that a small percentage of home based workers 7.38% - lived in joint families, but there were no workers living in joint families among factory-based women. The percentage of workers form extended families was dissimilar – there were 16.10% among the home based and 28.5% among the factory based.

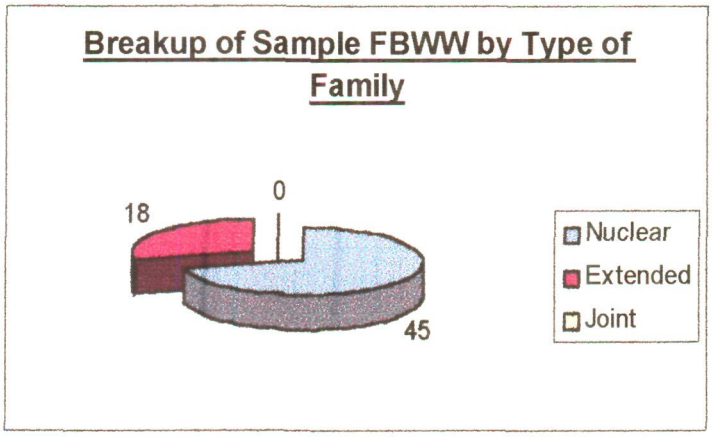


Fig.49

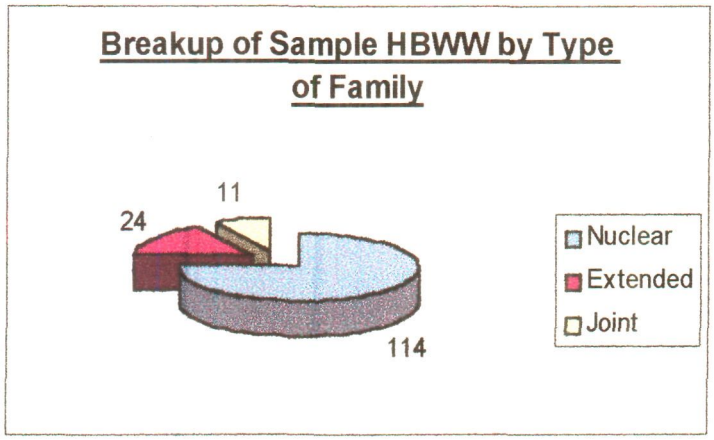


Fig.50

As more than 70% of the sample lived in nuclear families it is possible that it is one of the factors that contribute to the incidence of malnutrition in children. In studies by Grewal et al, (1973) and Gopaldas (1983) it was found that larger percentages of malnourished children belong to nuclear families. Contrary to this finding is the study by Srivastava (1991) in Banares, which states that children in nuclear families were better nourished as they could buy and consume what they wanted.

**Size of the Family:**

On an average the size of families of both the sample groups had 4-6 members – 69.13% in the home based and 57.14% in the factory based categories. Larger families of 10 members or more was found among the home-based women workers families (8.05%). Only 4.76% of the factory based women workers had large families. Though 26.98% of this group had 7-9 members. In the home based group only 16.77% of the families had 7-9 members.

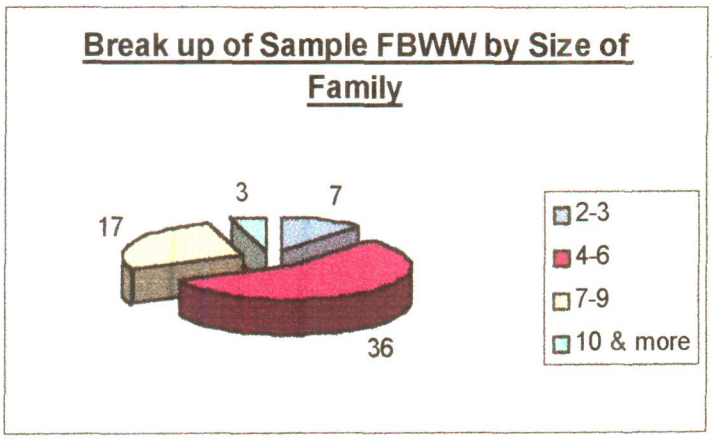


Fig.51

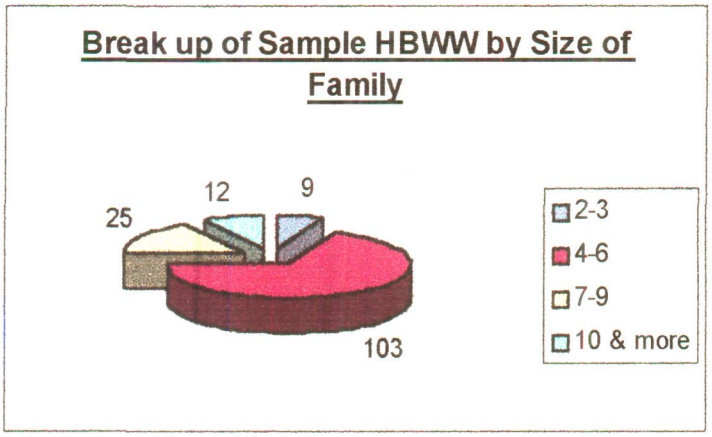


Fig.52

Most of the women workers felt that children were a gift from the almighty and as most of the children especially in the home based group started helping the mothers at work by the time they were 6 or 7 years of age, they were welcome.

**Family Income:**

This is yet another factor which played an important role in the health status of the family and specially the child. In the present study it was found that nearly 70% of the families of the sample were living below the poverty line. The exact income could not be elicited, as the work was irregular and payment was even more irregular. There was rampant borrowing from the moneylenders and once caught in their clutches – the women found it very difficult to extricate them. A study on Industrial Subcontracting (Baud, 1987) states the case of the Beedi Industry conducted in Allahabad by Bhatty. It was found that 86% of the women are Muslim.

The household these women belong to have a strong seclusion ethic, which makes it impossible for them to take on income generating work outside the home. Thus, they cannot bargain for better wages. They have to be satisfied with what they get. 72.48% of the home based women workers in the present study earned Rs.500 or less per month. 24.16% earned between Rs.501 and Rs.1000 per month and 3.35% earned between Rs.1001 and Rs.1500 per month.

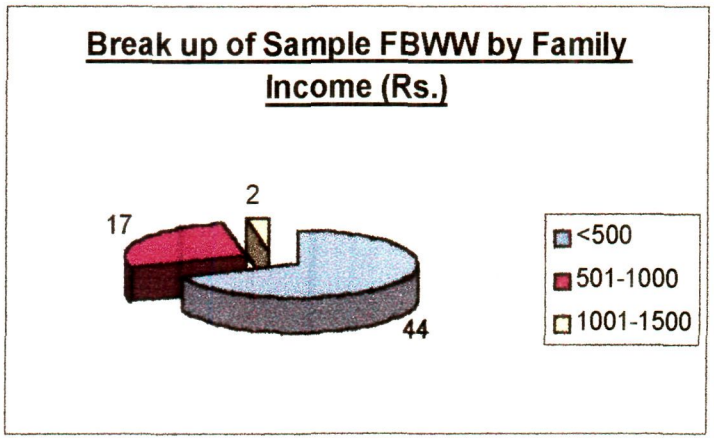


Fig.53

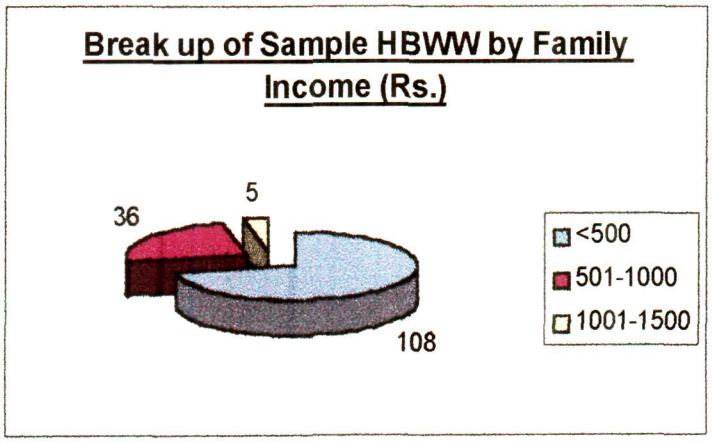


Fig.54

Among the factory based group of the sample 69.84% earned Rs.500 or less. 26.98% earned approximately between Rs.501 and Rs.1000 and 3.17% earned Rs.1001 and Rs.1500 per month. Almost the entire amount of the income earned by the women was spent on food for the family. Men's earnings, if not partially frittered away were kept away for a house or a wedding in the family. As a result, any withdrawal of the women's income directly affected the food expenditure of the family. This finding was in accordance with the studies by Clark (1981), Engle (1983), Popkin (1983) and Bhatty (1987). The NNMB Report (1987) states the obvious, that as income improves the consumption, energy, total fat and riboflavin increases. Economic constraints influence the decisions of families about the kinds of foods eaten by the family as also the food given to the child.

**Place of Origin:**

Another factor studied was the place of origin of the families. In the present study in Aligarh, it was found that the factory-based workers were mostly of local origin – 79.36% as against 20.64% migrants.

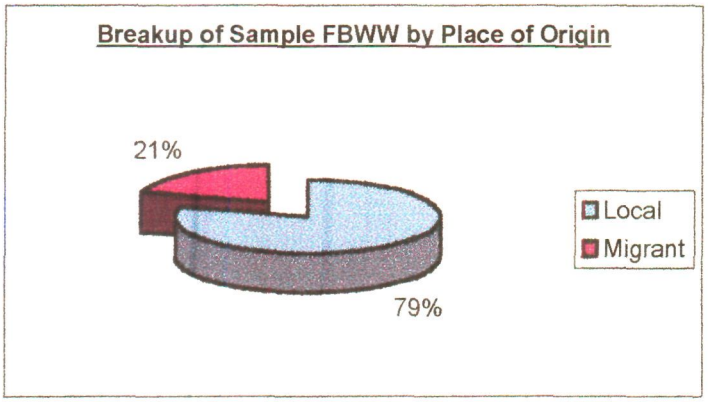


Fig.55

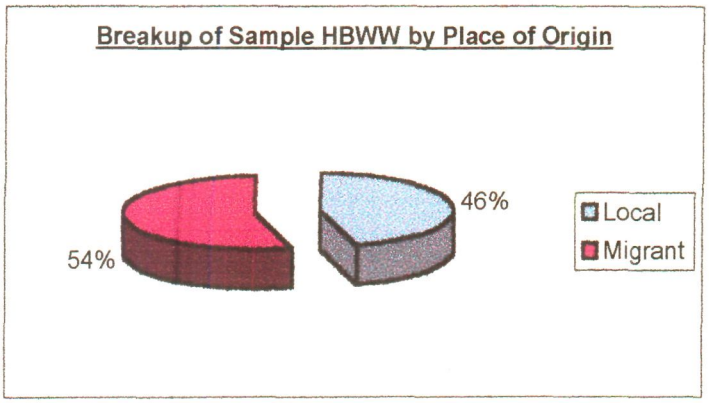


Fig.56

These migrants were from neighboring states mainly Bihar and Bengal. Among the home-based workers the migrants were larger in number 54.36% as against 45.63% locals. It was found that the migrants over the years were getting married to the locals and settling in Aligarh, where they felt they had better prospects.

**Religion:**

As regards religious affiliations the factory workers were predominantly Hindus 80.95% compared to the Muslim who were only 19.055. The home based workers were mainly Muslims 90.61% as against 9.39% Hindus.

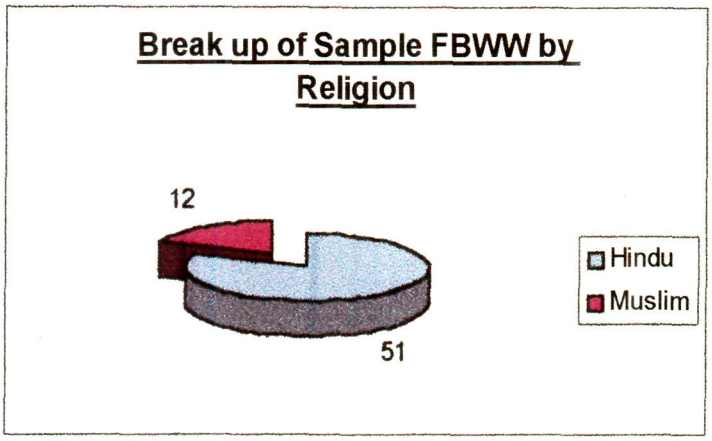


Fig.57

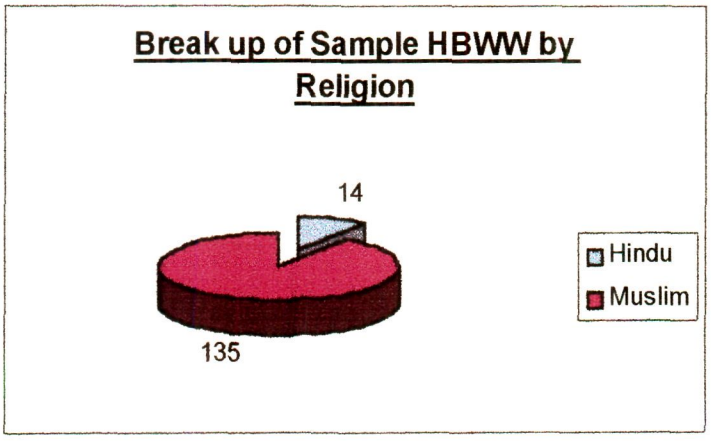


Fig.58

Analyzing these facts it appears that most of the migrants are Muslim. Again quoting the study conducted by Bhatty (1987) on the workers of the Beedi industry in Allahabad, the

majority of home based workers were Muslim as the work pattern suited their cultural ethos even if it was low paid.

**Literacy:**

The literacy level of the sample of women workers was very low. 77.78% of the factory-based women were illiterate and 22.23% had studied up to primary school.

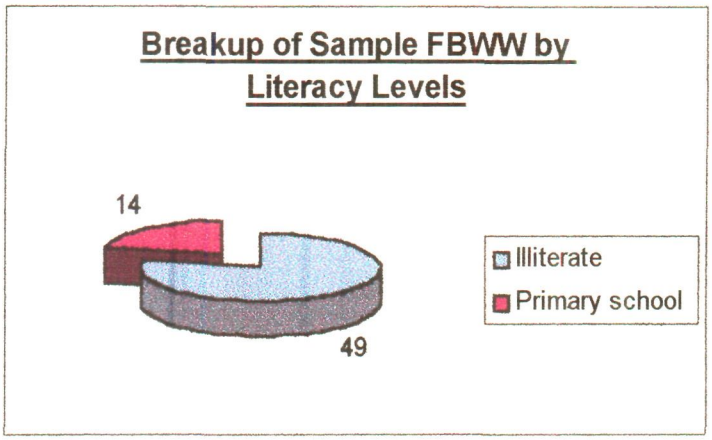


Fig.59

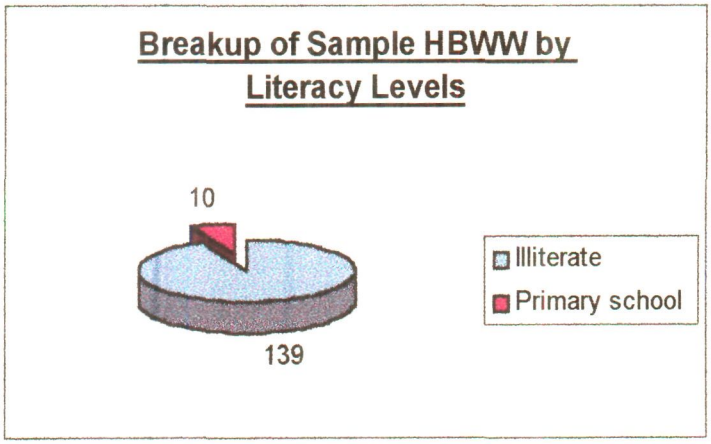


Fig.60

There was not a single worker who had studied up to high school. Among the home-based workers 93.28% were illiterate and 6.72% had reached primary school. It was found that the mothers did not insist upon school attendance for children. Except for a few factory-based workers most women voiced the view that in the world of today it was better that the child learnt a trade and started earning his keep than to spend his time at school. For school fees, expense for books and uniforms and of course tuition fees because very few schools had competent teachers and private tutors would have to be engaged. All this seemed an unnecessary expenditure – and there was no guarantee of returns in the near future.

**Husband's Employment:**

Regarding husband's employment it was found that almost identical percentages of husband in both groups were engaged in work on a regular basis – 26.98% among the factory based and 26.84% among home based working women. 23.80% of the FBWW had no husbands as compared to 34.22% of the HBWW. The majority of the husbands – 38.92% home based as against 49.20% of the factory based working women worked erratically.

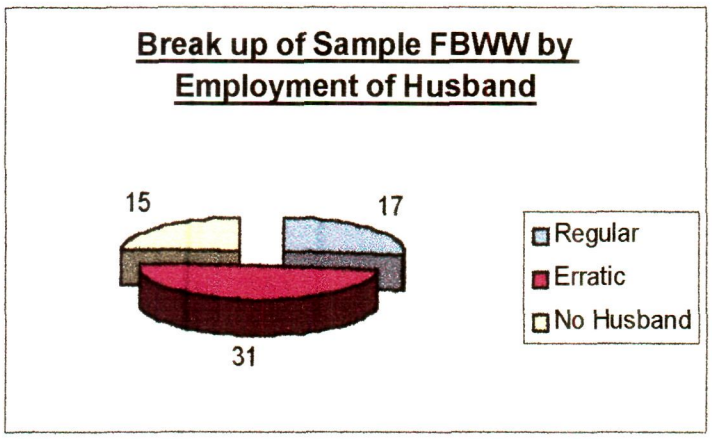


Fig.61

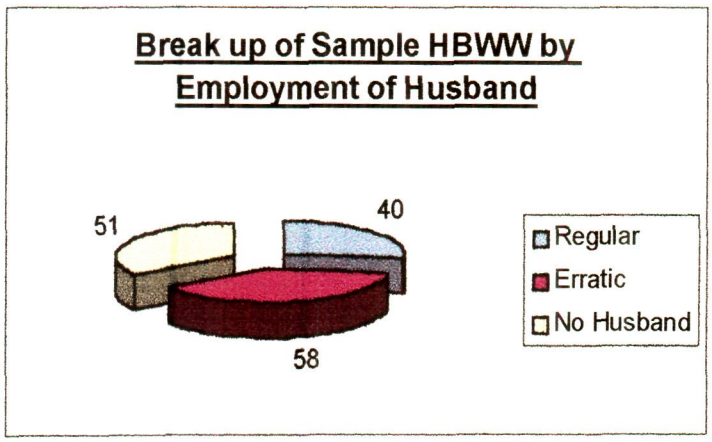


Fig.62

Some men did not work because of illness, some others because they seldom felt like it. There were still others who felt that as their wives had a source of income the responsibility of their families was not solely theirs. Even if they did not work the household fires would keep burning.

**Caretakers other than the Mother:**

Almost all the factory-based mothers did not take the child to the work spot. On being asked why this was so, the mothers

replied that the work environment was not equipped or conducive to childcare. It would be hazardous for both the mother and the child. There were no crèche facilities and neither was there provision for clean drinking water in any of the units visited. As the women were not on the rolls, the employers were not obliged in any way to provide such facilities.

As a consequence the child was often left at home under the care of siblings, who themselves were young children. Childcare was not the only task the sibling was responsible for. They often ran errands, washed dishes and looked after the house in the absence of the mother. They functioned as little mothers themselves (George, 1973). In a study by Arulraj and Samuel (1995) among women in the unorganized sector in Tamil Nadu it was found that the siblings apart from looking after the younger child or children, did all other kinds of housework and deprived of a formal education ended up in the same occupation as their mothers.

The Chi-square test for independence was conducted to assess whether nutritional status of the children was dependent on the presence of the mother.

Besides siblings, the young child was cared for by relatives, neighbors and sometimes even left alone on the streets. The factories were often near the home so mothers frequently checked up on the children. All in all, it was not a comfortable arrangement as sometimes devoid of adequate

supervision, infants and young children consume mud or poisonous substances, which causes diarrhea. This, if left untreated can cause death. There were instances of unattended children falling into drains. These findings are in agreement with the findings of Grewal et al (1973), Gopaldas et al (1988) and Arulraj and Samuel (1995).

From the results of the present study, it is evident that the two major factors for growth retardation among children are inadequate diets and inadequate childcare. The problem of the care of young children when the mother is engaged in income generating activities may be solved either by organized support services like crèches at very nominal rates. The solution for inadequate diets could be by providing the fathers with regular employment facilities to take the load partially off the mother. Increased income would lead to better quantity and quality of food consumed. Nutrition education by governmental and non-governmental agencies could emphasize the benefits of paying attention to the diets of girl children who will be the mothers of tomorrow.

**Health and Medical Facilities:**

The health and medical facilities available for the people living in the four areas studied is almost nil. The Primary Health Centers (PHC's) are not functioning, as they should. Whenever the need arises and if time permits, the people

would rather consult private practitioners than government functionaries.

The oft-repeated comment was that only neat and well-dressed patients were given attention as compared to the poor and ill-dressed but needy patients (This finding was similar to the findings by Geervani and Desai, 1998). Homeopathic clinics were the ones preferred especially for the small children mainly because the medicines are cheaper and are sweet.

The people were aware of immunization against polio but vaccinations against DPT were not being widely practiced. Occasional medical camps were held and the women and children who had the time attended them.

**Type of House:**

The type of house is the reflection of the economic status of the family. Most of the houses had cemented or brick lined floors but without exception all were badly lit with no provision for ventilation. It is obvious that crowded living areas give rise to unhygienic conditions leading to greater incidence and faster spread of disease. This leads to decreased food intake resulting in poor nutritional status. This finding was in accordance with the findings of Victora et al (1986).

# Chapter 6

## Conclusion

Studies of nutritional status are essential because it is clear that the nutritional status of the population is the major determinant of not only its health status but also of the process of national development itself (Gopalan, 1994). The economic and social progress of the nation depends on the health of its people. Children are the most vulnerable sections of society, especially children upto the age of 6 years. It is during this time that they require the maximum amount of care regarding their dietary intake because it is a period of rapid physical and mental growth. Public action can play a powerful role in promoting essential aspects of the quality of life (Dreze and Gazdar, 1999).

Uttar Pradesh is one of the largest states in India, and it also boasts of the largest number of politicians – 7 Prime Ministers over the past fifty years. Unfortunately it is also the state, which lags behind most of the other states in the country in many Human Development Indicators. It has the highest under 5 mortality rate (U5MR) and according to a recent national survey on family health the incidence of malnutrition among children below 6 years is the second highest, Bihar being the first.

According to estimates by the RBI for the years 1997-98, the population of U.P. was 164 million. The child population (0-6

years) was 20.27% of the total population. These numbers will help in gauging the magnitude of the problem of malnutrition among children. Aligarh, the locale of the present study is a small city in Uttar Pradesh. Besides being a university town, Aligarh is also an industrial center for brass works. These industries rely chiefly on piece rate labour – factory based and home based. The main reason for this is that labour, specially migrant labour, is cheap in Aligarh. There are large numbers of these workers, mainly women, who constitute most of the work force.

The nutritional status of this highly exploited but invisible labour force is the focus of this study. Surprisingly there has been almost complete neglect of this aspect in similar researches. The physical development of this large group of children is directly affected by the low incomes earned as also by the immediate environment. The general objective was to assess their nutritional status using national and internationally accepted reference standards and classifications.

Four areas of Aligarh city were selected for the study. The sample belonged to the homogeneously poor strata of society. All were living under fairly uniform socio economic conditions. 212 women constituted the sample of working women – 149 home based and 63 factory based. The reason why a lesser number of factory based women workers were studied was that employers refused to acknowledge that they employed women at all. The number of children of these

workers who fell into the age group of 1-6 years was 320. 213 of home based mothers and 107 of factory based mothers.

In order to identify the role of the socio economic and environmental factors on the health of the child, data on demographic particulars of the family, their income, type and size of the family, community facilities like the provision of potable water, toilets, utilization of health services, religion, origin – whether local or migrant, work pattern of the parents were collected. Non-participant observations during the various visits were also noted. Anthropometric measurements of the children were also taken – height, weight, head circumference, mid upper arm circumference, sitting height and calf circumference and mean values were also calculated. Case studies were conducted in 7 families and accompanying photographs have been attached, to supplement the study.

A three-tier questionnaire was used for collection of data – one for the unit, one for the women workers and one for the child. Questions were formulated on the basis of standardized schedules of the Indian Council of Medical Research and the Labour Bureau, Government of India (see appendix). A pilot study was conducted after which the questions were suitably modified for use.

The weight and height measurements of children were converted into weight for age, height for age and weight for

height percent of standard for each child using NCHS Standards. The ICMR standards were also referred to for some measurements. Based on the Harvard Standards, the IAP standards and the NCHS Standards the children were classified into various categories of nutritional status – normal, mild, moderate and severe malnutrition. The classifications used were Gomez's, Jelliffe's, Indian Academy of Pediatrics and the National Center of Health Statistics. Both age dependent and age independent anthropometry classifications were used because the sample population was largely illiterate and exact dates could not be elicited.

Quantitative data were subjected to statistical parametric tests while qualitative data were analyzed and interpreted accordingly. The findings of the study were as follows –

1. The 12-23 month age interval among both the groups studied had the maximum number of severely malnourished children.

2. The most severely malnourished children among factory based and home base women workers were girls.

3. The birth order of the malnourished girl children fell steeply after 4.

4. The heights and weights of almost all the children in both the groups were below the reference standards set by the Indian Council of Medical Research, the Indian Academy of Pediatrics and much below the internationally accepted standards set by the National Center of Health Statistics.

5. The mean Mid Upper Arm Circumference of the children of factory based women workers was better than the MUAC values of the children of the home based women workers.

6. The mean calf circumference values of the children of the factory based women workers was greater than the calf circumference values of the children of the home based women workers.

7. Head circumference values of boys from both groups were greater than the head circumference values of the girls.

8. Chest circumference values of the children of the factory based women workers were higher than the corresponding values of the home based group and at some age intervals were higher than the ICMR standards.

9. The chest head ratio of the children of factory based working women was not less than 1 at any age interval. The home based sample children had values less than 1 till the age of two years.

10. The Rao Index indicated that all the children were malnourished at the 12-23 month interval after which there was a slight improvement. At the 36-47 month interval all the children showed normal values.

11. The Kanavati Index showed that children of factory based working women were less malnourished than the children of the home based group.

12. The Quetlet's Index clearly depicted the fact that most of the children of home based women workers were in a state of gross malnutrition. The children of factory based working women were marginally better nutritionally.

13. According to Gomez's Classification, most of the boys in the factory-based group were in Grade 1 and Grade 2 of malnutrition. There were no boys who were severely malnourished. 20.4% of the girls were in Grade 3 while the majority were in Grade 2 and Grade 1. Among the children of the home-based working women, the percentage of boys who were normal was slightly higher but there were 11.2% in the severely malnourished Grade 3. The majority were in Grade 2.

The percentage of girls in Grade 3 was 28.8% while 45% were in Grade 2 and 22% in Grade 1.

14. Assessment of nutritional status by Jelliffe's classification showed that most of the children of both the groups were in Grade 2 of malnutrition though the findings indicated that one-fifth of the girls were in Grade 4 and no boys were present in this category. In the home based group of children there were no children in the normal category till the last age interval. The majority of boys were in Grade 3 (36.20%) while the girls were in Grade 2 (32.98%). An equally large number of girls (28.88%) were classified in Grade 4. Boys had a much lower percentage in this grade.

15. According to the classification recommended by the Indian Academy of Paediatrics, a large percentage of children fell marginally into the normal category especially after the age of 3 years in both the groups. Most of the boys in the factory based working women's group were in Grade 1 as also the girls. The only difference was that there were girls (16.32%) in Grade 4 while there were no boys in Grade 3 or Grade 4. Among the home based group, the boys and girls were mostly in Grade 1 and 2 although the percentage of boys in Grade 4 (5.17%) was slightly lesser than the percentage of girls (6.18%).

16. In the classification of the National Center of Health Statistics it was found that most of the boys were underweight and stunted (68.96%) in the factory-based group while only 61.22% girls were underweight and stunted. There were a lower percentage of boys who were stunted and wasted as compared to the girls (24.48%) in the wasted category there were 8.62% boys and 10.2% girls. 6.89% of the boys were in the normal category. IN the group of children of home based women workers 11.2% boys were under weight as compared to 12.37% girls, 43.96% boys were stunted as against 47.42% girls. 14.65% boys were wasted as compared to 12.37% girls and 23.27% boys were stunted and wasted while only 21.64% girls fell into this category.

17. There were significant differences in the Nutritional Status of the groups. The CFBWW were better than the CHBWW till the age of 3 years. Environmental factors – potable water, toilets, immunization have played a positive role.

18. The nutritional status of children of both the groups became noticeably better after 3 years of age.

19. The sample children of both groups showed that the majority had sparse dyspigmented hair and pale conjunctiva.

20. The diets of the children were mainly carbohydrate in content.

21. A higher percentage 57.11% of factory based working women's children were immunized as compared to 30.51% of children of home based women workers.

22. Most of the factory based women workers were locals of Aligarh while most of the home based workers were migrants.

23. The majority of the factory based working women were Hindus while the majority of the home based working women were Muslim.

24. Only 27% of the husbands in both the groups were employed on a regular basis.

25. Most of the home based and factory based workers lived in nuclear families.

26. The majority of women workers of both the groups earned Rs.500 or less a month.

27. The women workers of both the groups were mostly illiterate.

28. The majority of children of both groups were left in the care of older siblings.

29. A larger percentage (68.25%) of women from the factory based group had easier access to potable water as compared to 54.36% of the home based group.

30. 52.3% of the factory based working women had toilets in their homes as compared 37.59% of the home based working women.

31. The presence of the mother did not have a significant impact on the nutritional status of the child.

32. There is no significant difference in the nutritional status of the children of factory based working women and the children of home based working women after the age of 3 years.

33. After the age of 3 years, the nutritional status of the child depended more on the food availability in the family rather than on any other factor. Availability of potable water, toilet facilities and immunization played secondary roles.

The results suggest that the mother's work pattern influences the food availability in the family, which affects the nutritional status of the child. It has also been noticed that the gender and birth order of the child determine the food distribution within the family. This study will add to the

## Limitations of the Study

This study is in no way exhaustive.

The secondary data collected are assumed to be true and reliable.

A longitudinal study of a smaller sample of children and mothers would have been more meaningful instead of this cross sectional study.

Time and resources permitting samples from others cities could have been studied to obtain more comprehensive results.

The responses of the women in the sample could not be ascertained for accuracy.

## Recommendations

Nutrition education should be an important component of health services.

In order to effectively intervene to prevent malnutrition greater emphasis must be given to food intake of children in the 0-3 year age group, which is the period of maximum nutritional risk.

Suitable weaning foods should be sold at subsidized rates through the public distribution system.

Facilities given to women workers should be one of the bases for selection of small-scale industry owners for governmental and non-governmental assistance.

Specialized incentives should be given to small-scale industry owners who provide facilities to women employees for childcare at the work premises.

## PROFILES OF THE CHILD:

### Zubeida:

Zubeida was Bano's daughter. She was the fourth child in the house and was 3 years old. Bano was a factory based worker. The family belonged to Aligarh. Zubeida at first was extremely apprehensive and reluctant to come near. To restore her equanimity, I weighed and measured most of the other children before I attempted to coax her. She acquiesced finally, tear stained, unwashed and uncombed she submitted to the measurements – ready to bolt. When I told that it was over she looked up as if to say "Is that all?'

Zubeida had sparse, discoloured hair and her teeth were irregular and stained. Her nails were unclean and pale and stomach distended. On being asked what she ate, she replied roti with tea in the morning and roti with chili chutney in the evening. Bano's husband, Noor Mohammed, a truck loader, had deserted her and was now living with a Bihari woman in Delhi. Consequently Bano's income was barely sufficient for the basic needs of her family.

### Shamsuddin –

Shamsuddin is a one-year-old boy and is the first child of Baseeran, a home based worker of Jeevangarh.

Shamsuddin's father, Nanhe, is a rickshaw puller. Baseeran and her parents had migrated from Bihar in search of jobs.

Shamsuddin is a dark, thin child with dry discoloured hair and a moon face. He has not started walking by himself. His mother who was in an advanced state of pregnancy was carrying him. The child had not been immunized against any diseases. On being asked about his dietary intake, Baseeran said that she fed him a few 'niwale' (morsels) when she ate. The home based nature of her work allowed him to be with her always but she herself seemed tired and malnourished.

**Mala –**

Mala is the third child of Guddo and Radhakishen. Guddo works in a nearby factory. She is expecting her fourth child. Mala is one and a half years old and spends the day with her older brother at home. Occasionally she accompanies her mother to work. The child is slight in build with discoloured hair and moon faced. Her eyes are bright but she has not started to talk.

Her diet was mainly roti and green chili chutney. Tea with a little milk and 'bura' (powdered sugar) was given once a day. The mother cooked food twice a day in the morning and the evening. There was no concept of weaning foods and no special foods were given to the children. They ate whatever was available in the house. Sometimes

RadhaKishen brought samosas or kachoris on his return from work. He worked as a truck loader. The older children Pramod 5, and Pushpa, 4, did not attend school. Guddo hoped to admit Pramod the following year to the school nearby. Pushpa was needed at home to look after Mala.

**Aqueel –**

Aqueel is about two and a half years old and is a sugar baby. His mother Haseena is a home-based worker. Aqeel is Haseena's fourth child and second son. The older son, Shakeel, died of pneumonia a year ago. He was seven at that time. Haseena's husband is a rickshaw puller but his work is not regular as he is in indifferent health. The days he works, he brings home Rs.20 or Rs.25 after paying off the hiring charges for the rickshaw.

Aqeel has discoloured hair and a bloated appearance. He needed a lot of coaxing to be measured. When his mother assured him that he was being measured for new clothes for 'Eid' he agreed reluctantly. On being asked about his eating habits Haseena proudly stated that the child is fond of biscuits, so she indulges him by buying a few daily. He barely eats one roti a day. Dal is cooked when money is available. Meat (Buffalo's) is bought once a week and vegetables very rarely. The most frequently bought vegetables are potatoes.

## PROFILES OF THE MOTHER:

**Kammo –**

She belongs to the large section of unorganized workers who form more than 90% of the labor force. Kammo is a factory-based worker in a local metal cap for bulbs industry. She is in her late thirties, of slight build and obviously underweight. She belongs to a scheduled caste Hindu family. Her husband Dalchand is a truck loader. His job is erratic in the sense that he goes for work when he feels like it. Kammo's job at the factory is also easy going. There are no regular working hours. She is paid fro the amount of work she produces.

Her work involves pressing pre-cut metal disks into a mini cup shaped form using a hand press. Weighed metal disks are entrusted to her as soon as she arrives at the factory and the weighed finished product is taken back. Ill-formed pieces are discarded. She is paid according to the pieces she successfully completes. The payment is by weight. The actual amount of time she spends doing the work is her business. Officially she is not on the rolls of the factory. There are a dozen women like her in the same factory. Kammo works along with the other women in an ill ventilated room. There is a tap in the courtyard but no toilet facilities. Young boys at the various machines in the next room carry out other parts of the production process. One or two of her colleagues join in the conversation occasionally.

On being asked about her family, I learnt that she had two daughters and two sons. She lost her eldest daughter 5 years ago. The daughter had apparently died during childbirth. The granddaughter Rajo is living with Kammo's family and is 5 years old.

Kammo's youngest son SriKishen is 2 years old. He is looked after by his 5 year old niece while his mother is at work at the factory. Suresh the older son is 12 and does not attend school. Bhagwan Devi the other daughter is 17 and is now married to her brother-in-law, her dead sister's husband.

While being questioned Kammo was not very forthcoming. She wanted to know what she would get out of this whole exercise. Kammo hedged when asked about the total family income. The workers later told me that Dalchand, the husband, was an inveterate gambler and drunkard. The money he earned was invariably spent on drink. Kammo's income from the factory helped to make both ends meet. The time spent at the factory was a welcome change from the household drudgery. Not much thought was given to any welfare measures to be provided by the employers – nor any fight for rights and privileges.

Regarding care of young children, Kammo said that no special care or foods were prepared for them. They grew up on what was available in the house. Attending school was also not important. On being asked whether sons and daughters were given similar types of food and amounts to eat, Kammo declined to comment.

**Shameem –**

Shameem, 24, is a Sunni Muslim factory based worker. Her husband Javed had been burnt to death by his brothers. The cause for the killing was a dispute over property. He had left behind two young daughters, Asma and Reshma, 4 years and two years old. Left to fend for herself and her daughters, Shameem had taken up this job in the metal cap factory.

She came every morning at nine but rushed home frequently to check on the children. The 'jhuggi' she lives in is near the factory premises. Occasionally she brought the children to work but they often proved to be more of a distraction. She was scared that they would run out on the main road and come under a passing vehicle. More often than not the children remained at home, the older one, 4-year-old Asma, taking care of the 2 year old Reshma. On being asked how she spent the money she earned, she replied that almost the entire amount was spent on food. What remained was spent on medicines for the children. The children contracted malaria often and there was the perpetual cough and cold to deal with also.

As in Kammo's case, the time spent in the factory was a welcome change from the harsh realities of life. She did not ask for more. Shameem's in-laws were avaricious people. At the time of marriage Shameem's her parents had given a radio and a television besides a bed, a dressing table and a three-piece sofa set. After Javed's

death, the in-laws had taken away all her material goods and thrown her and the children out of the house. Maybe her story would have been different had her children been sons – she mused.

Shameem was a quiet person and rapport was established only after repeated visits. The woman was very subdued – unlike her talkative co-workers. She still seemed shocked by what her in-laws had done. On being questioned as to why she did not return to her parent's home, she replied bitterly that problems existed there also. She was reluctant to divulge details. On my next visit, Shameem was nowhere around. Her co-workers said that her mother-in-law had forcibly taken her away. This was what Shameem had been afraid of. She feared they would kill her also.

**Zarina –**

She is a home-based worker and is about thirty years old. Zarina is a Sunni Muslim from Patna, Bihar. She and her husband, Sabir, came to Aligarh in search of jobs 7 years ago. At that time she had 3 daughters, Ameena, Abida and Ayesha.

Sabir started work as a manual labourer with a mason living nearby. What he earned was not enough to make both ends meet, so Zarina tried for jobs as a domestic worker – a 'mehri'. But that meant, leaving the girls alone at home or taking them along for work. Employers did not

like the idea of three young children let loose in their garden or 'aangans'. So Zarina was soon out of jobs. It was then that a neighbor introduced Akhtar to Zarina.

Akhtar was a local agent for a metal cap factory owner. Frequently he brought pre cut metal discs to these home based women workers. He installed hand press machines on his cost and showed the women how it was to be operated. He outlined all the plus points of working from home to Zarina and as an added incentive he said that the older daughters, Ameena and Abida, could also help the mother at the hand press whenever they were free. True, the payment was low, but then, he stressed, the merits far outweighed the disadvantages. Thus, Zarina became a home-based worker and joined the great army of the unorganized sector.

She soon became adept at her work and the little money she earned goaded her on to earn a little more. Housework and childcare were relegated to the background or gradually entrusted to Ameena, the eldest daughter. What Sabir earned as a labourer was put away towards acquiring a plot and a house while the money she earned was spent on food and small luxuries for the family. Very soon there were a couple of additions to her family – Pappu and Shanu, both sons. Aligarh, she felt was lucky for her family.

When asked why she was not sending her children to school, she was quick to ask whether school attendance would ensure them a good job. She said that the sooner a

child starts to earn, the better. It would keep them out of mischief too. On being asked whether any special foods were given to the young children, she replied in the negative but said that occasionally they were allowed to buy ice balls –'barf ke gole' a concoction of grated ice in bright colours moulded around a stick and sold by a vendor in the most unhygienic surroundings. Milk was bought almost everyday – a little was used for tea for the family but the husband drank the major share.

Zarina had a couple of hens also but she usually sold the eggs. The money earned from this was spent on small items of clothing or bangles. A few years ago Sabir had bought a secondhand T.V set. The evenings when there was no electricity cut were spent watching serials or film based programs.

# PHOTO FEATURE

Growing up beside open drains

The young caretaker and his ward

Looking for Mother

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APPENDIX I

A. WORKER LEVEL QUESTIONNAIRE

I. IDENTIFICATION PARTICULARS:

I.I. Name of the Women Worker:

I.2. Age

I.3. Native Place:

L - Local

M - Migrant

I.4. Caste: Religion

I.5. Literacy level

| Iliterate | Primary School | H. School | Tech. | Graduate |
|---|---|---|---|---|

I.6. Marital Status

| Unmarried | Married | Divorced | Separated | Widowed |
|---|---|---|---|---|

I.7. Type of family: Nuclear / Extended / Joint

I.8. Family composition

| S.No. | Name | Relationship to worker | Sex | Age | Literacy | Occupation |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

2. FAMILY INCOME

2.I. Total monthly income of family from all sources?

2.2. Per capita income:

2.3. Amount spent on children:

2.4. Amount spent on food:

3. TIME ALLOCATIONS

3.I. Time devoted to daily household work (timing & total time)

3.2. Duration daily leisure time available.

3.3. How is leisure time usually spent?

4. FOOD

4.I. Meal pattern?

| Morning & Evening | Morning | Afternoon | Night |
|---|---|---|---|

4.2. Vegetarian / Nonvegetarian

4.3. Who is responsible for food preparation & serving

| | Preparation | Serving |
|---|---|---|
| Self | | |
| Spouse | | |
| Children | | |
| Others | | |

4.4. Who buys food items for the family:

4.5. Any food fads during pregnancy. Food avoided? Special foods given

4.6. Any special food given to the mother after the birth of the child.

4.7. Did you breast feed your children
if yes, how long?

4.8. What is your opinion about powdered milk?
Do you follow the instruction on the container?

4.9. Are any special foods cooked for the younger children:

4.10. Do you know the importance of early nutrition on children

4.11. Are sons and daughters given the same amounts and types of things to eat:

4.12. Are you influenced by your co-workers
regarding food, care of young children?

4.13. Do you share food with one another during lunch time?

4.14. Do you buy snacks for children from vendors?

4.15. Are you influenced by advertisements
regarding food? Billboards, Radio, T.V.,
newspapers.

4.16. Do you buy milk for the family?
how much daily?

4.17. Do you bring your child to work?
if not, why?

4.18. Who feeds your child when you are at work?

5. CHILD ILLNESSES AND DEATHS:

5.I.

| S.No. | Sex of child | Age | Illness | Deaths | Cause |
|---|---|---|---|---|---|
| | | | | | |

5.2: No. of pregnancies etc.

| S.No. | No. of pregnancies | Living & Healthy children | still births | Abortion Miscarriag |
|---|---|---|---|---|
| | | | | |

5.3 Where your children born at home or in the hospital

ANNEXURE 2 (Same Same as previous)

B. UNITLEVEL QUESTIONNAIRE

I. IDENTIFICATION PARTICULARS

I.I. Name & Address of the Unit:

I.2. Description of industry & items produced:

I.3. Organised sector/Unorganised

I.4. Annual Turnover:

2. EMPLOYMENT

Total number of persons employed in the factory

| Sex | Time rated | Piece rated | Total |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| Men | | | |
| Women | | | |

3. Distibution of Women-workers by age

| 15-18 | 19-24 | 25-34 | 35-44 | 45-54 | 55+ | Total |
|---|---|---|---|---|---|---|
| | | | | | | |

4. Distribution of women workers by marital status

| Never married | Married | Divorced/separated widowed | Total |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| | | | |

5. WAGES & EARNINGS

5.1 What is the criteria for fixing wage rates of men and women?

5.2 List the occupations in which you employ women and their respective earnings.

| Name of occupations | Periodicity of wage payment | Wage/worker per month |
|---|---|---|
| | | |

6. SHIFTS AND HOURS OF WORK

6.1 Total number of shifts and time periods

| Shift | From | To |
|---|---|---|
| I | | |
| II | | |
| III | | |

6.2 Are women excluded from night shift?

7.2 Is a creche provided by the employer?

if yes, give the following details

a) Working since when?

b) Description of surroundings

c) Source of water supply

d) Toilet for children

e) Any refershment supplied
if yes:

| Frequency | Quantity |
|---|---|
| | |

f) Provision of stafflike Ayah, Sweeper etc.

g) Average daily attendance per week:

| 0-2 Yrs. | 2-6 Yrs. | Total |
|---|---|---|
| | | |

7.3 If the creche was functioning earlier.

reasons for its discontinuation.

7.4 Whether there is any common room or place to exchange views during lunch/free time.

7.5 Are there any other welfare facilities provided by the employer regarding the worker's children at the place of work, or otherwise:

| Medical | Recreational | Others |
|---|---|---|
| | | |

7.6 Does any doctor visit the unit?

if yes, frequency.

8. TRAINING & SUPERVISION

8.I Do you formally train the workers prior to the job?

if yes, for how long?

8.2 Is there any supervision of women workers while work is in progress?

9. EMPLOYERS' VIEW:

9.I Are there any occupation in your unit where men & women do the same job?

9.2 What is your opinion about conversion among workers during work time?

9.3 Reasons for employing women?

9.4 Reasons for not employing women?

9.5 Are the women workers subjected to any medical check ups before during employment.

C. CHILD SCHEDULE (Based on I C.M.R. Pre-School Examination Record)

I. GENERAL INFORMATION:

I.I. Name of child:

I.2. Name of mother:

I.3. Name of father:

I.4. Address:

I.5. Age of child:

I.6. Sex:

I.7. Birth order:

2. ANTHROPOMETRY

2.I. Height (cms)

2.2. Weight (kgs)

2.3. Sitting height (cms)

2.4. Head circumferences (cms)

2.5. Chest circumference (cms)

2.6. Arm circumference (cms)

2.7. Calf circumference (cms)

3. CLINICAL EXAMINATION

3.I. Hair Healthy

3.2. Sparse

3.3. Discoloured

3.4. Easily plucked

FACE

3.5. Healthy

3.6. Moon face

3.7. Nasolabial dyssebea

EYES:

3.8. Healthy

3.9. Conjunctional xerosis and keratomalacia

3.10. Bitot's spot

3.11. Corneal xerosis and keratomalacia

3.12. Corneal opacity

3.13. Night Blindness

3.14. Pale conjuctiva

LIPS:

3.15. Healthy

3.16. Angular stomatitis

3.17. Cheilosis

TONGUE

3.18. Healthy

3.19. Red and raw

3.20. Papillae atrophic

3.21. Papillae hypertrophic

TEETH & DENTITION

3.22. Healthy

3.23. Caries

3.24. Mottled Enamel

GUMS:

3.25. Healthy

3.26. Spongy, Bleeding

SKIN:

3.27. Healthy

3.28. Follicular hyperkeratosis

3.29. Crazy pavement dermatosis

NAIL :

3.34. Healthy

3.35. Oedema

3.36. Marasmus

GASTROINTESTINAL SYSTEM

3.37. Healthy

3.38. Pot Belly

MUSCULO SKELETAL SYSTEM

3.39. Healthy

3.40. Beading of ribs

3.41. Knock knees and bow legs

3.42. Pigeon chest

4. BIOCHEMICAL LAB INVESTIGATION

4.I. Blood HB level

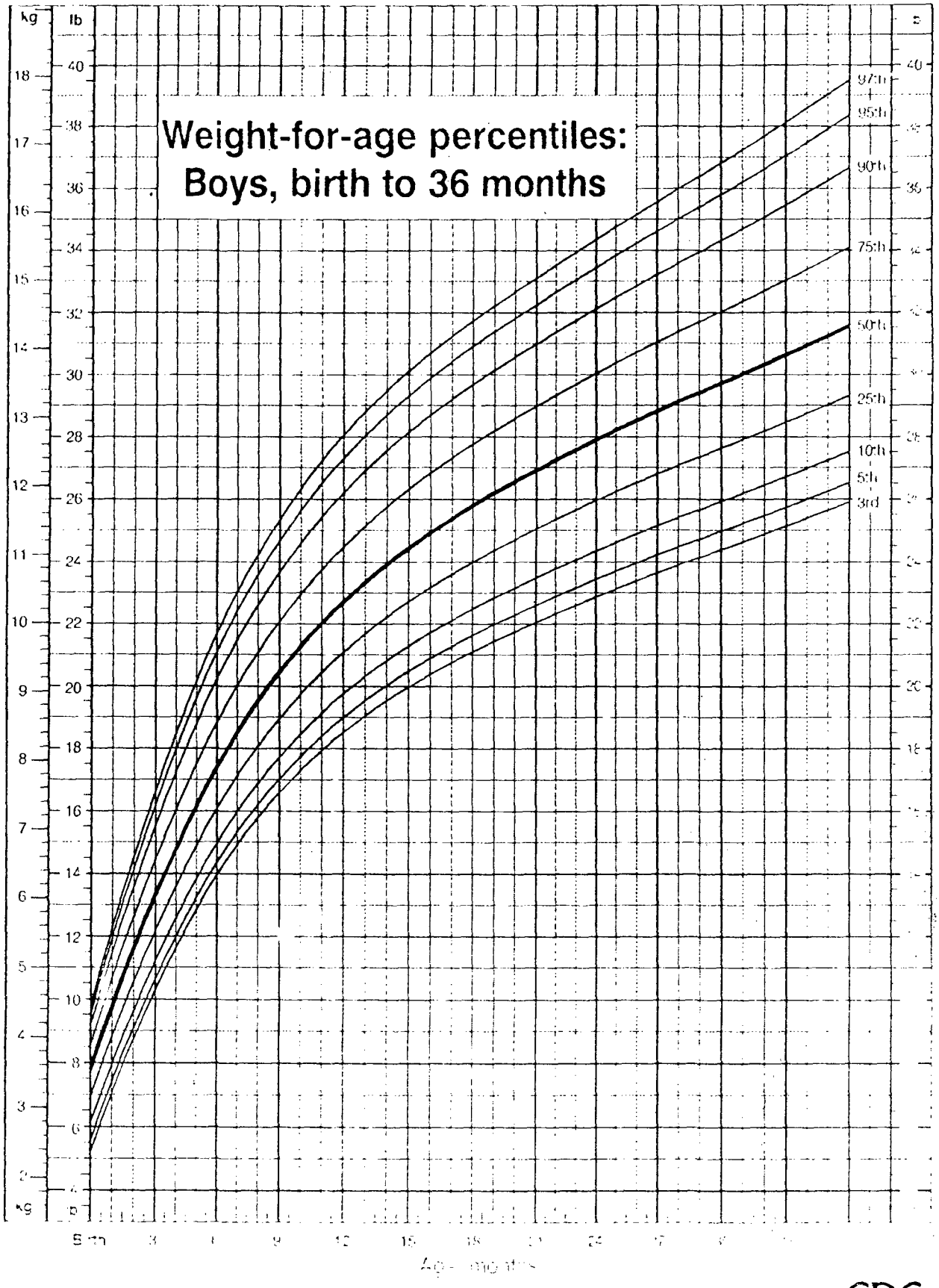
Has the child been immunised?

5. DIETARY RECALL

5.I

| Food items | Frequency | Approximate quantity |
|---|---|---|
| Milk | | |
| Chapati | | |
| Vegetable | | |
| Dal | | |
| Egg | | |
| Meat | | |
| Fish | | |
| Ghee oil | | |
| Gur | | |
| Nuts | | |

# CDC Growth Charts: United States

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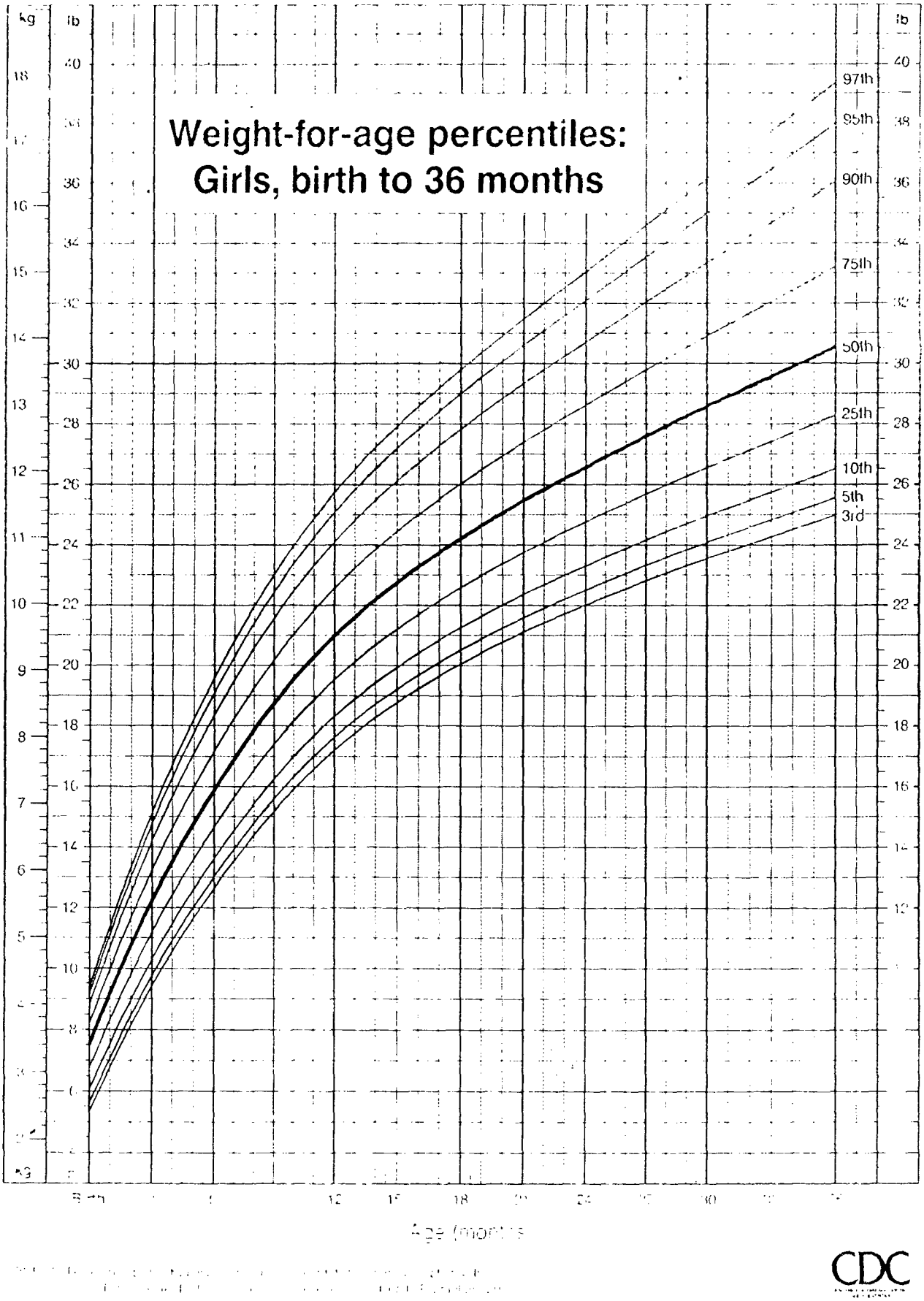
# CDC Growth Charts: United States

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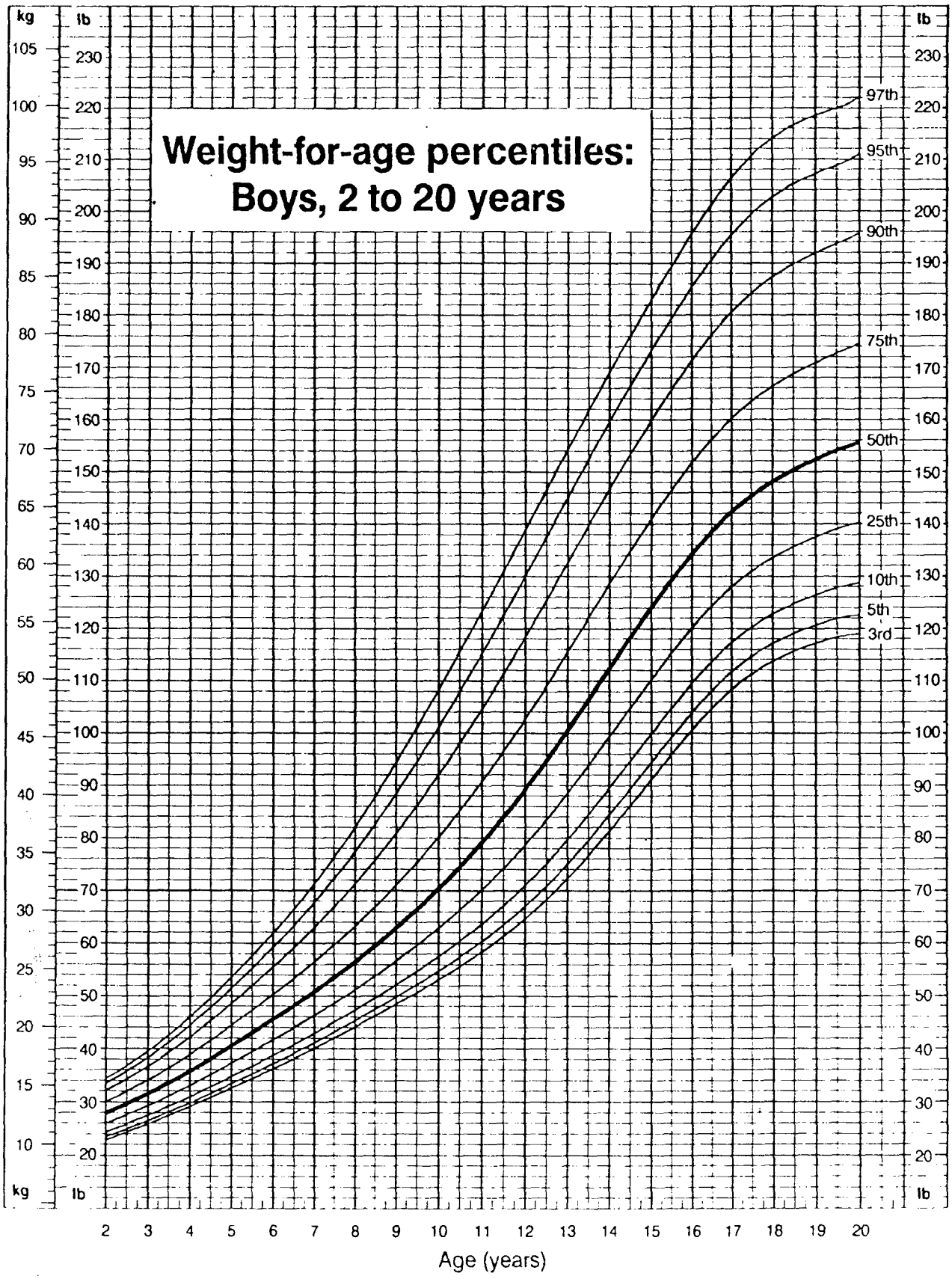
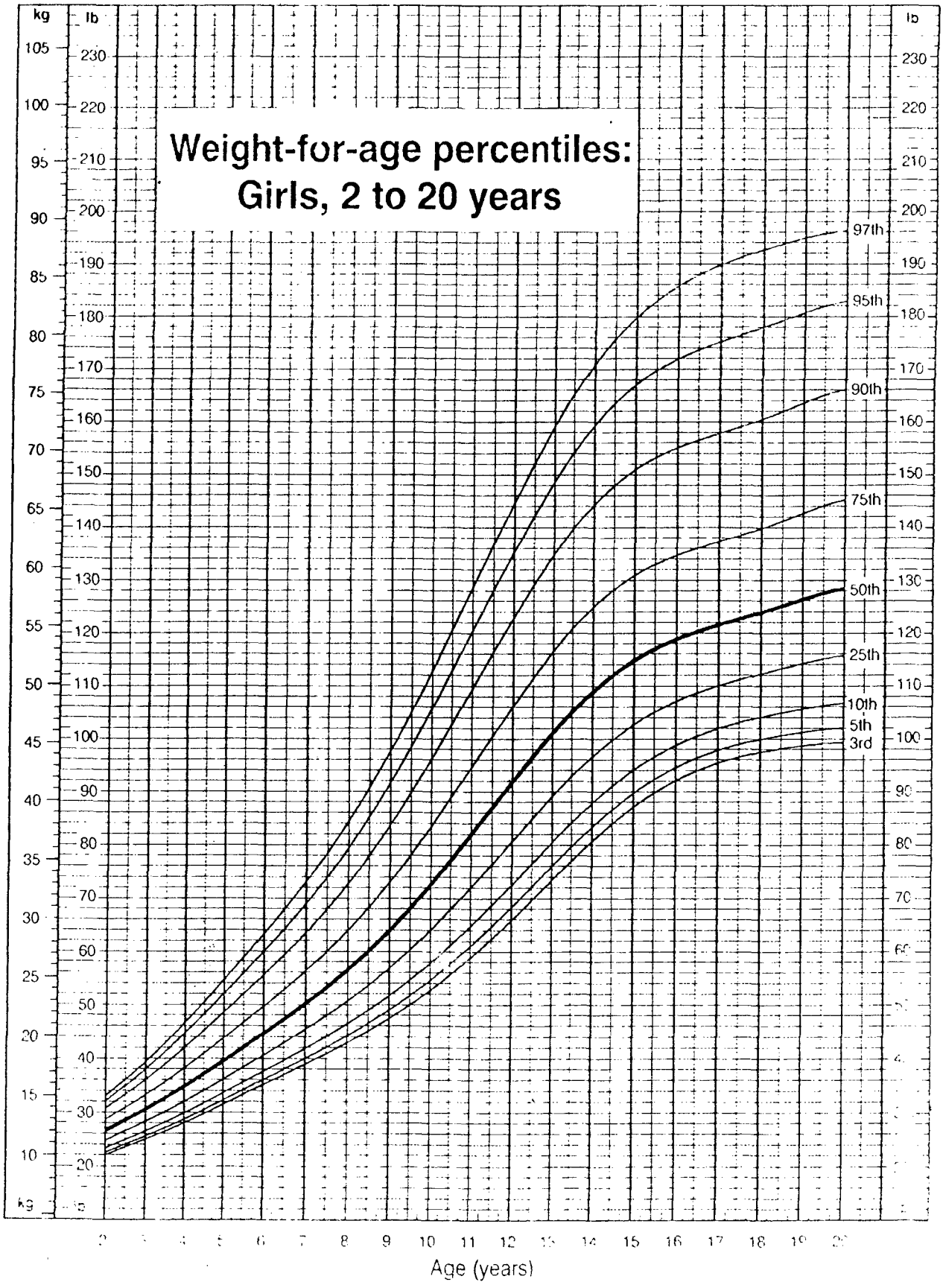



SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

CDC

# CDC Growth Charts: United States




SOURCE:

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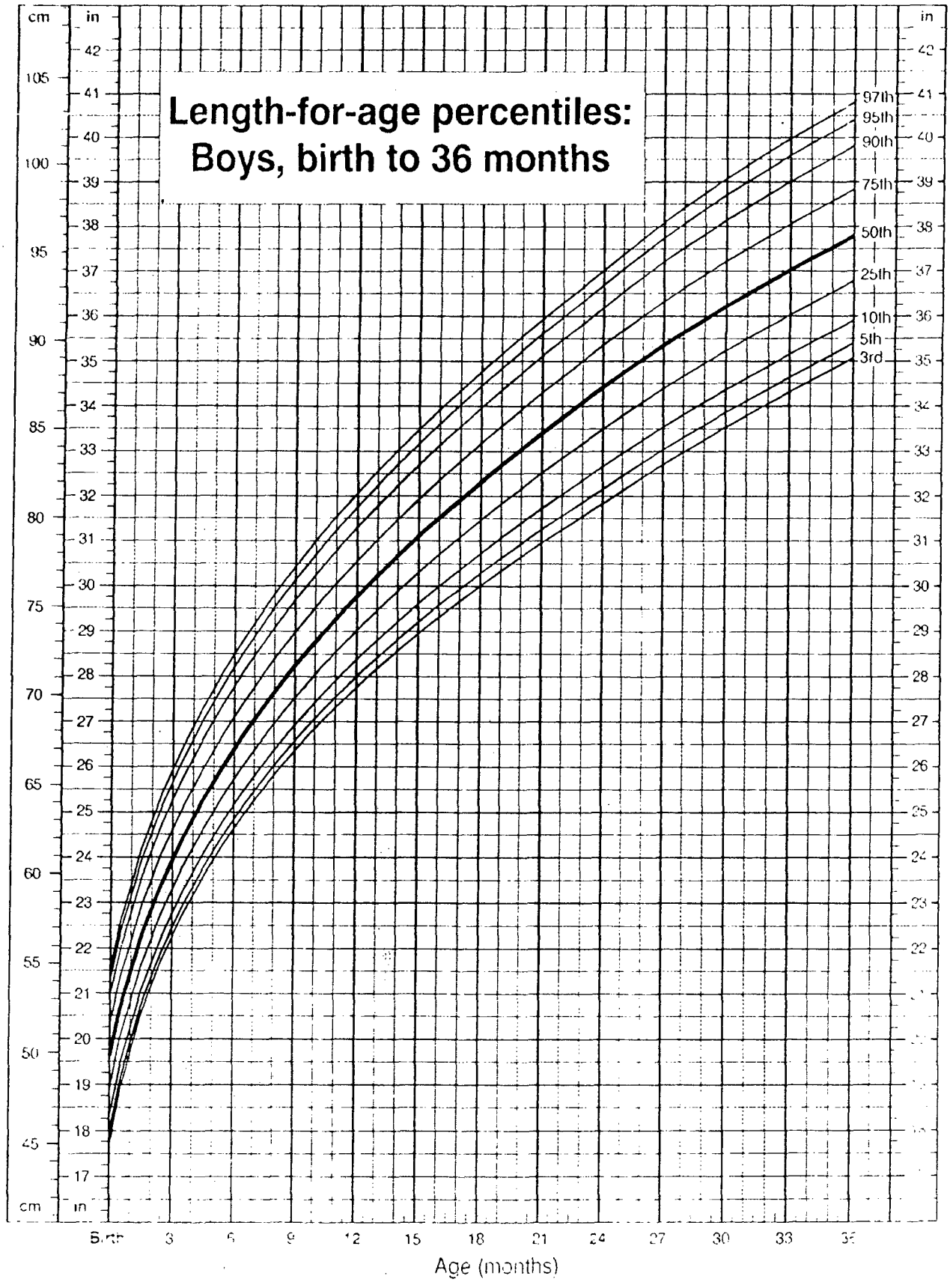
# CDC Growth Charts: United States

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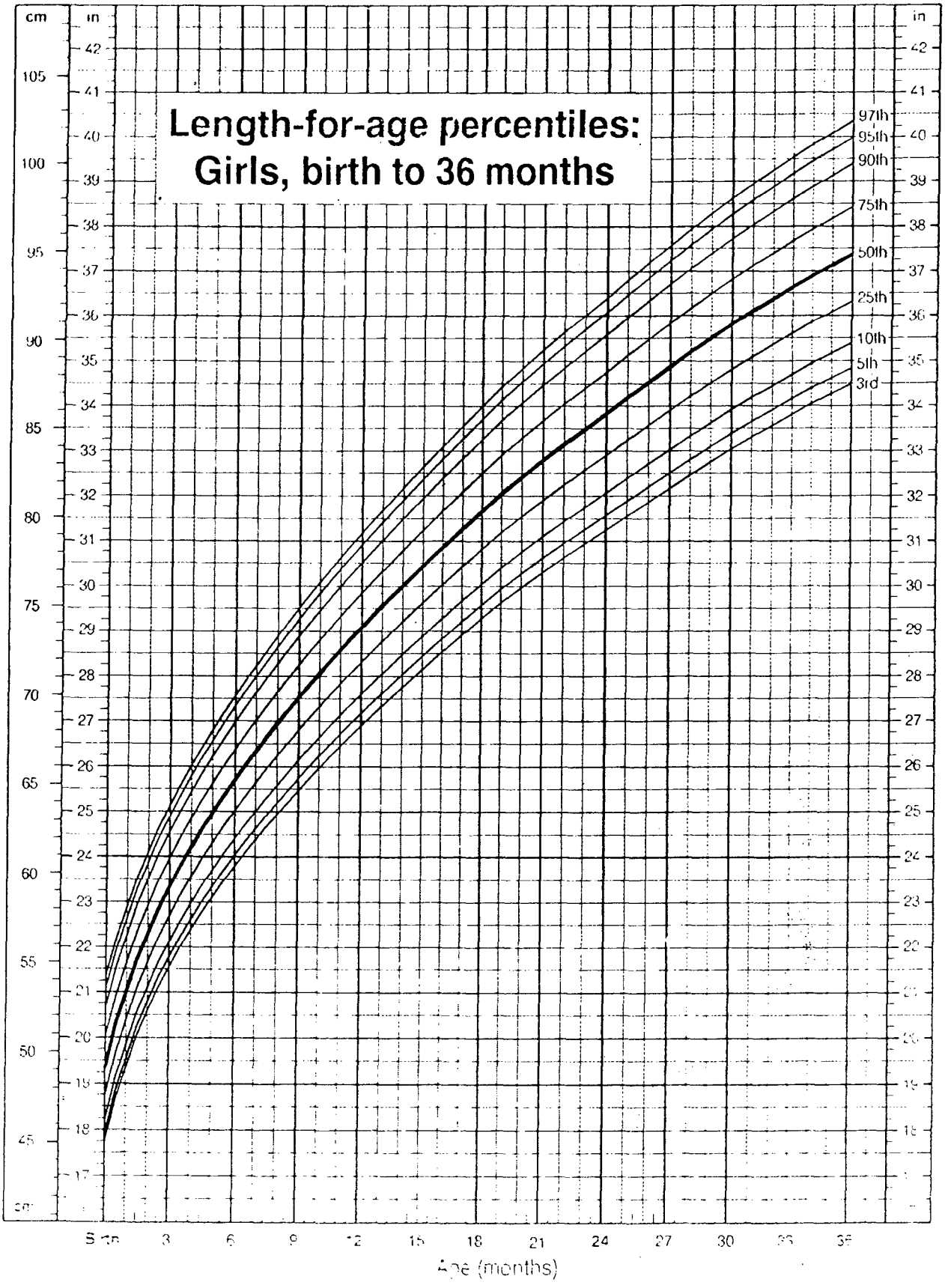


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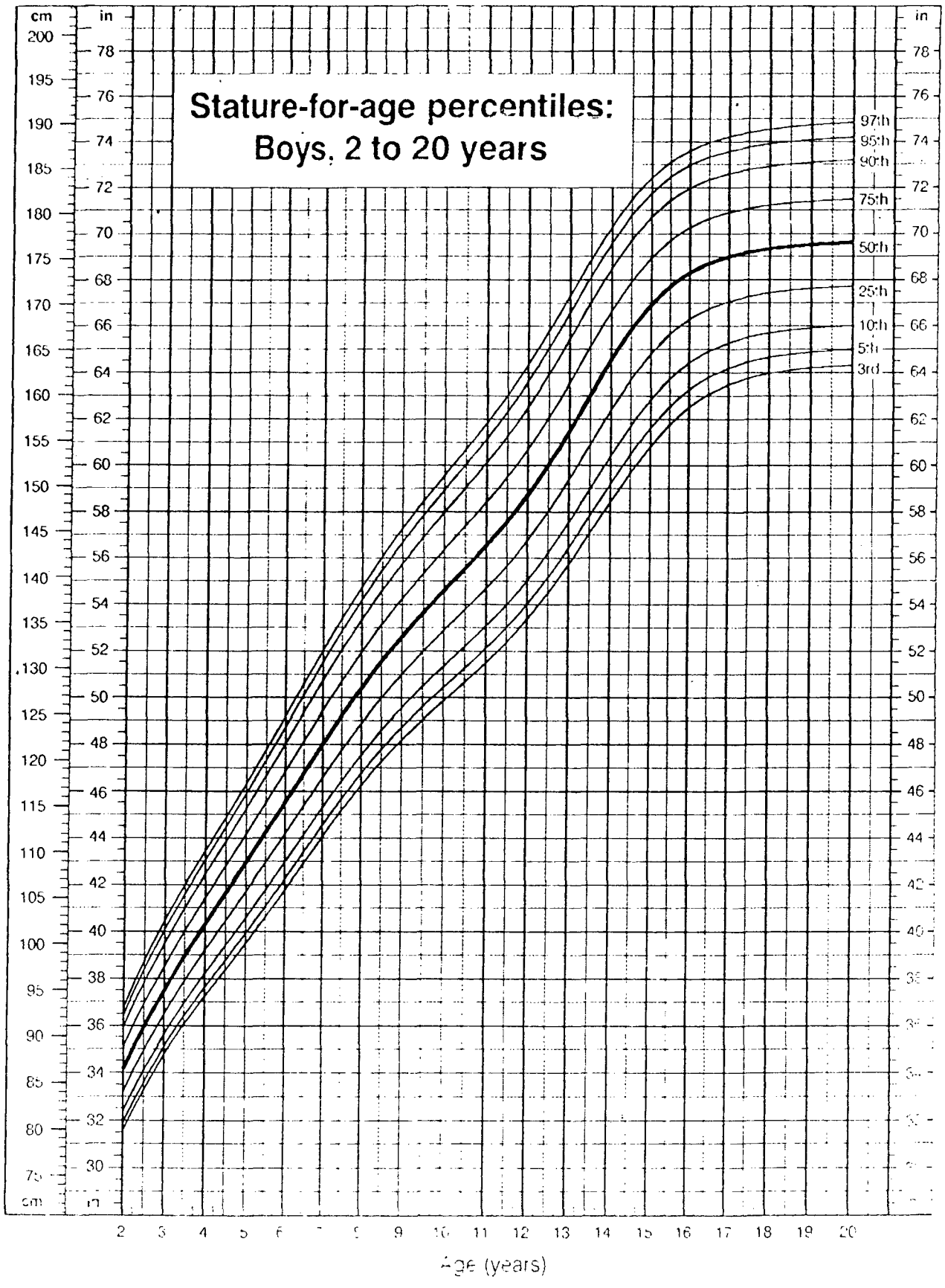


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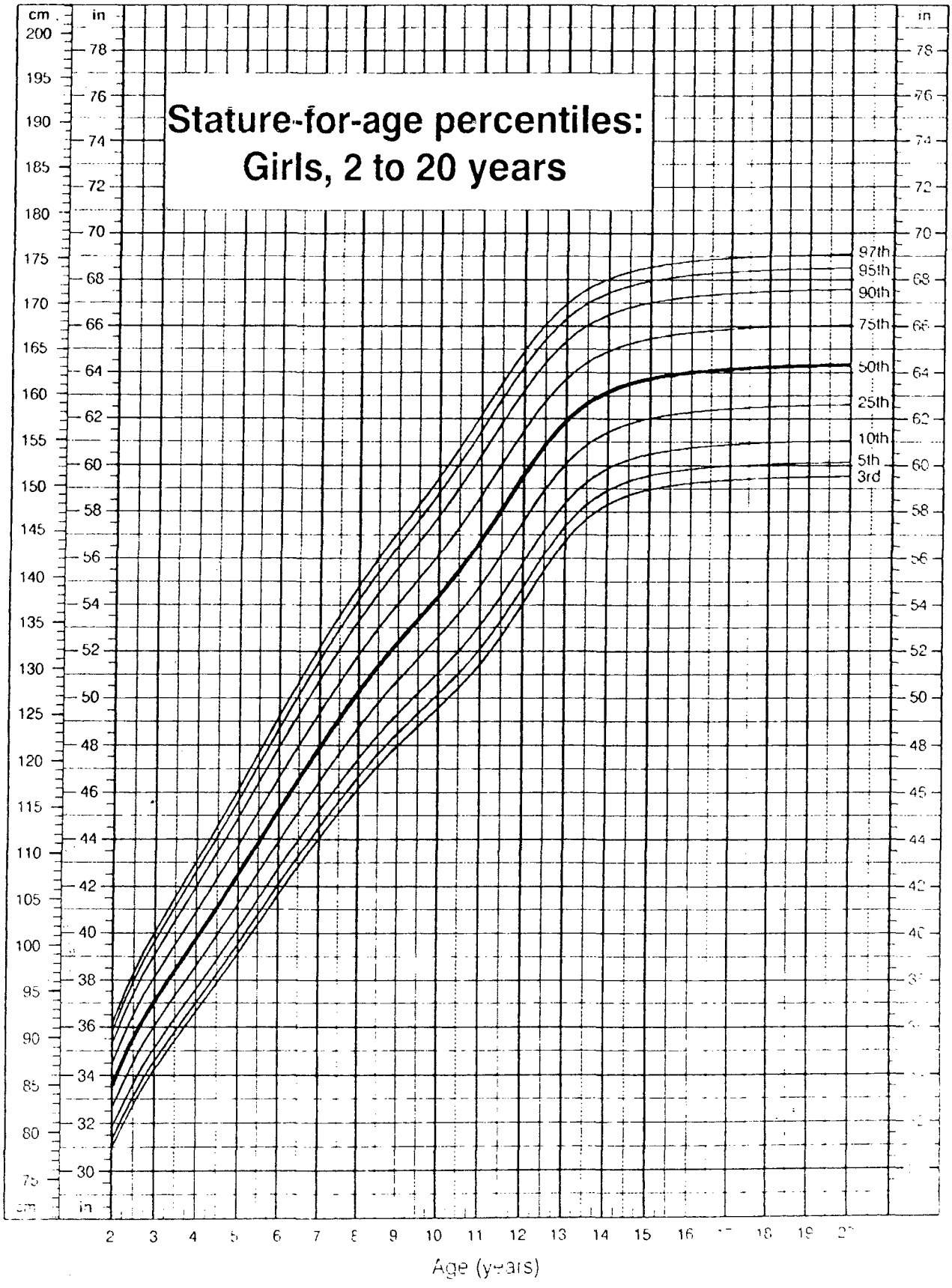


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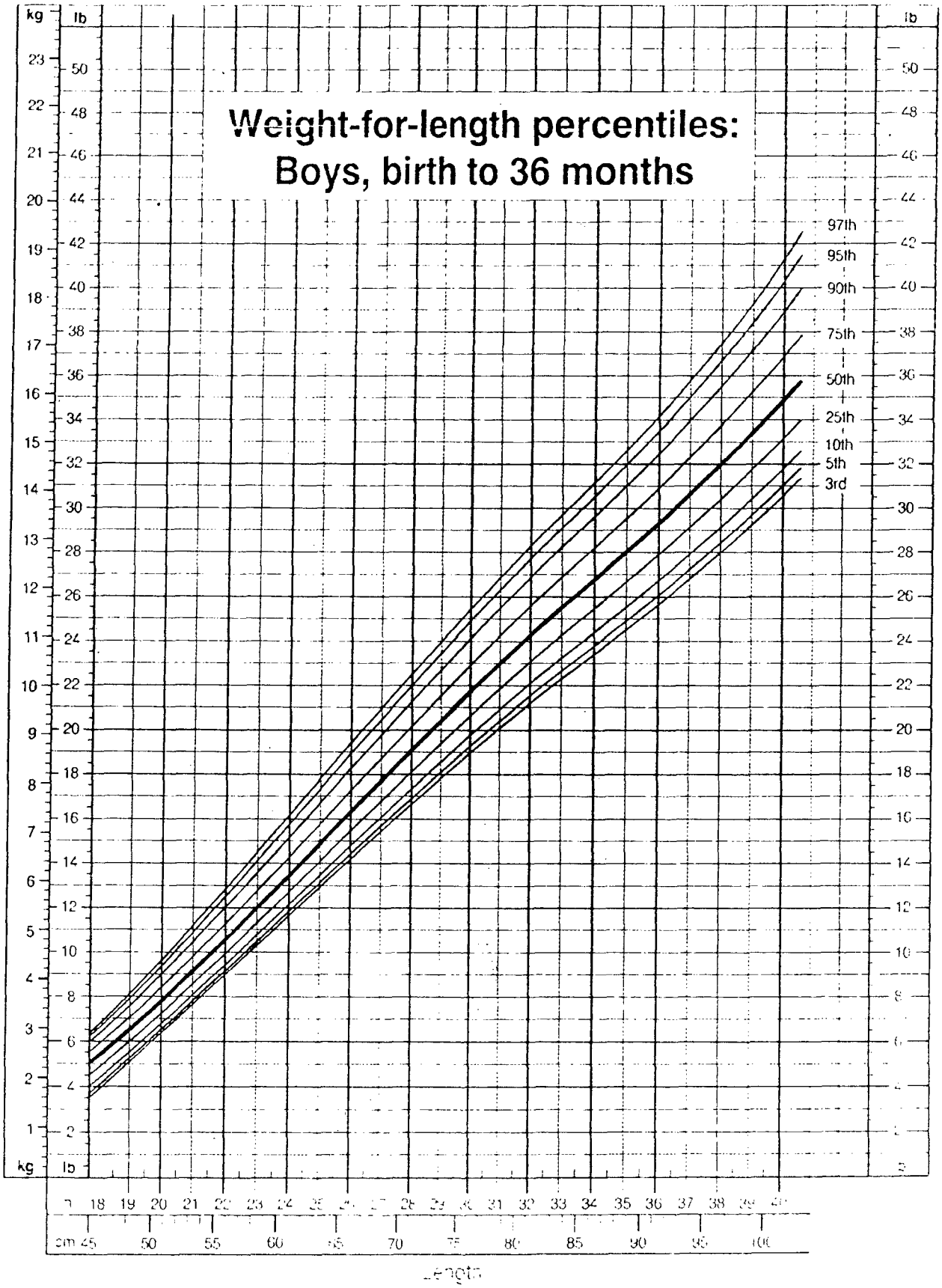


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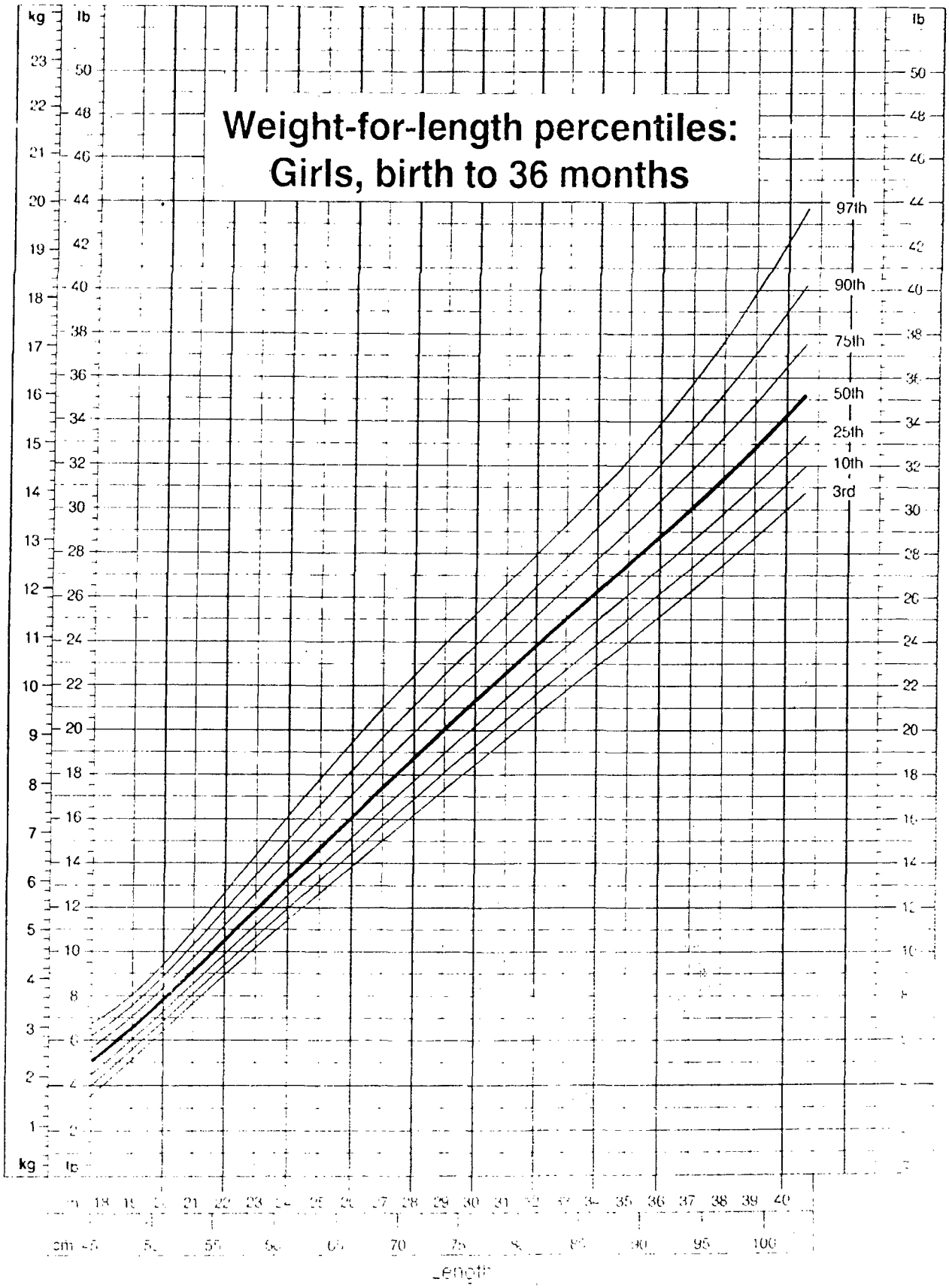


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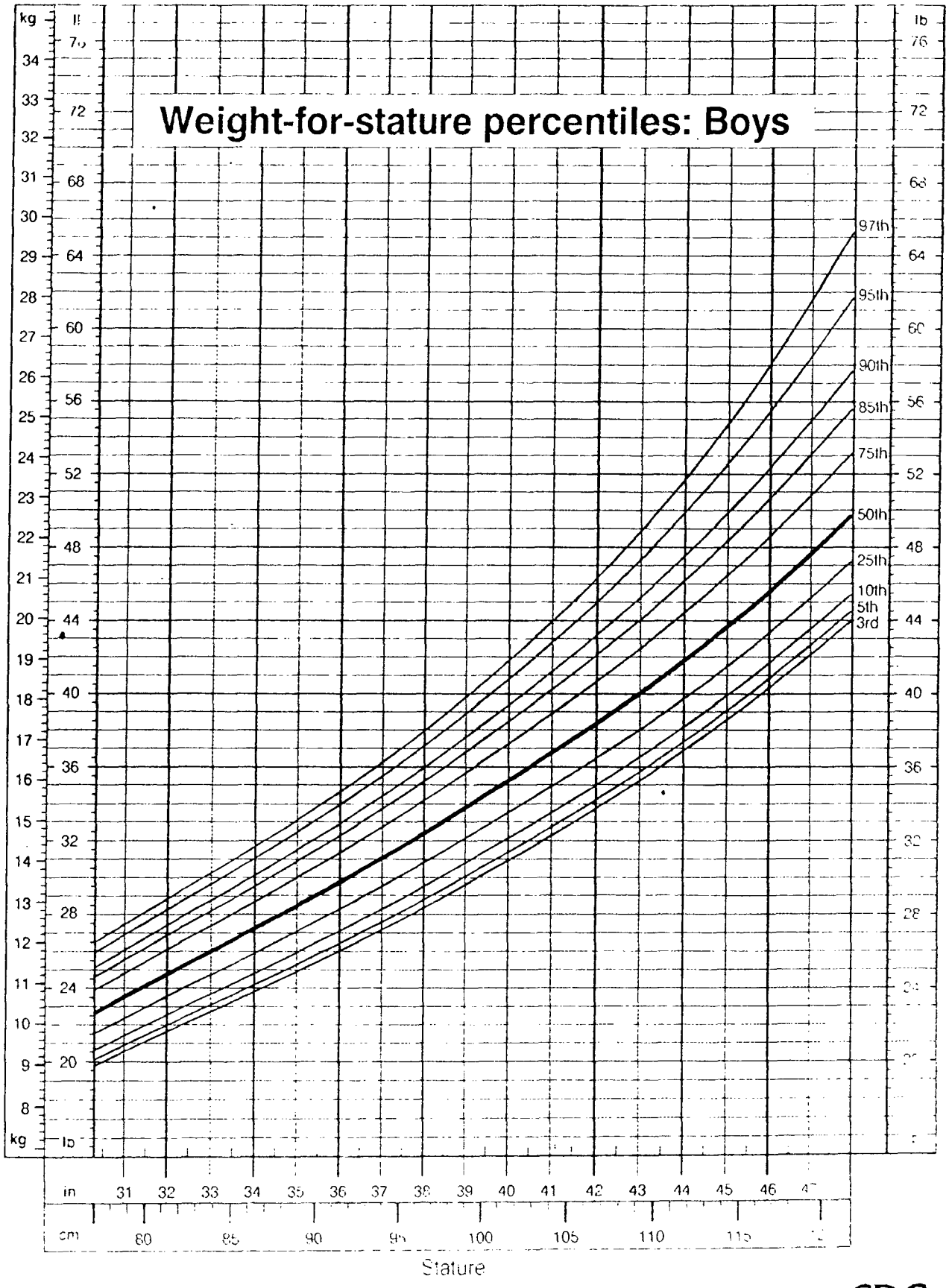


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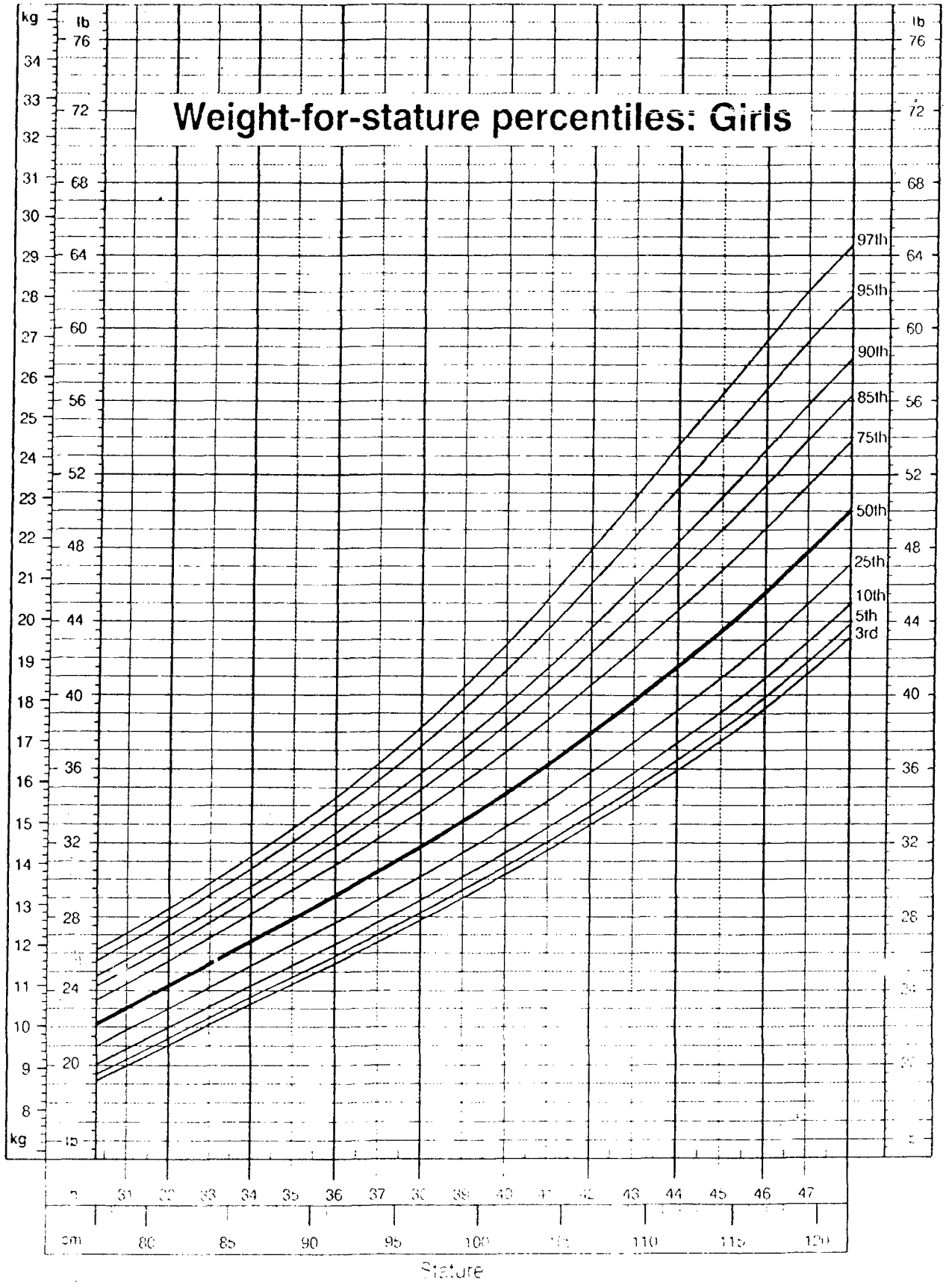


SOURCE: [illegible]

Table-I

Women work force in India in 1971 and 1981

| | 1971 | 1981 |
|---|---|---|
| Female population (as % of total Population) | 264 M (48.2%) | 331 M (48.3%) |
| Work participation | 31 M | 47 M |
| Working women as % of total women | 12.13% | 14.44% |
| Total women in unorganised sector | | |
| Women in unorganised sector as % of total | 29 M | 46.24 M |
| working women | 94.00% | 96.33% |
| Women in agriculture as % of working women | 82.81% | 81.23% |

Source: YOJANA, July 1-15, 1989

Table-12

All India work force in unorganised sector in 1981

| Sector | Male | Female | Total |
|---|---|---|---|
| Agriculture | 114.1 M | 37.56 M | 151.7 M |
| | (75%) | (25%) | (100%) |
| Manufacturing | 16.8 M | 4.3 M | 21.1 M |
| | (81%) | (19%) | (100%) |
| Services | 22.4 M | 4.4 M | 26.8 M |
| | (84%) | 16%) | (100%) |
| Total | 153.4 M | 46.2M | 199.6 M |

Source: YOJANA, July 1-15, 1989

Table-Life and Death.I99I
1.3

| | Life Expectancy | | Infant Mortality Rate | Female-Male Ratio | Total Fertility Rate |
|---|---|---|---|---|---|
| | Males | Females | | | |
| India | 59 | 59 | 80 | 0.93 | 3.6 |
| China | 68 | 7I | 3I | 0.94 | 2.0 |
| Kerala | 69 | 74 | I7 | I.04 | I.8 |
| UP | 57 | 55 | 98 | 0.88 | 5.I |

Source: Dreze and Sen (I995), Statistical Appendix.

## Table-India, Uttar Pradesh and South India: Selected Indicators

| | India | Uttar Pradesh | South India |
|---|---|---|---|
| Population, 1991[a] (million) | 846 (74) | 139 (80) | 196 (70) |
| Life expectancy at birth, 1990-2 (years) | | | |
| Female | 59.4 | 54.6 | 64.0 |
| Male | 59.0 | 56.8 | 60.9 |
| Death rate, age 0-4, 1991 (per 1,000) | | | |
| Female | 27.5 | 38.4 | 17.8 |
| Male | 25.6 | 33.2 | 18.9 |
| Literacy rate, age 7+, 1991 (%) | | | |
| Female | 39 | 25 | 49 |
| Male | 64 | 56 | 68 |
| Average per-capita consumer expenditure, 1987-8 (Rs/month at 1970-1 prices) | | | |
| Rural | 41.2 | 37.7 | 43.2 |
| Urban | 61.2 | 55.1 | 57.1 |
| Head caunt Ratio, 1987-8 (percentage of the population below the poverty line) | | | |
| Rural | 45 | 42 | 41 |
| Urban | 37 | 42 | 42 |

Note a In brackets, the proportion of the population living in rural areas (percentage)

Source: Dreze and Sen(1995), Statistical Appendix, based on data presented in Nanda(1992), Government of India (1993a), Tendulkar et al.(1993) and derived from the 1991 censes, the National Sample Survey and the Sample Registration System The life expentancy figures are unpublished estimates supplied by the Office of the Registrar General. The figures for 'South India' have been calculated as weighted averages of the relevent state-specific figures.

Table-Among children under four years of age, the percentage classified as undernourishedaccording to three anthropometric indices of nutritional status by state, India,I992-93

| State | Weight-for-age | | Height-for-age | | Weight-for-hei | |
|---|---|---|---|---|---|---|
| | Percentage below-3 SD | percentage below-2 SD | Percentage below-3 SD | Percentage below-2 SD | Percentage below-3 SD | Percer below- |
| I | 2 | 3 | 4 | 5 | 6 | |
| Inida | 20.6 | 53.4 | 28.9 | 52.0 | 3.2 | I7.5 |
| North | | | | | | |
| Delhi | I9.0 | 4I.6 | I9.3 | 43.2 | 2.7 | II.9 |
| Haryana | 9.0 | 37.9 | I9.3 | 46.7 | 0.6 | 5.9 |
| Himachal Pradesh | I2.9 | 47.0 | U | U | U | U |
| Jammu Region of J & K | I3.8 | 44.5 | I8.6 | 40.3 | 3.4 | I4.8 |
| Punjab | I4.2 | 45.9 | I5.7 | 40.0 | 2.8 | I9.9 |
| Rajasthan | I9.2 | 4I.6 | 26.6 | 43.I | 5.2 | I9.5 |
| Central | | | | | | |
| Madhya Pradesh | 25.3 | 57.4 | U | U | U | U |
| Uttar Pradesh | 24.6 | 59.0 | 55.6 | 59.5 | 2.7 | I8.I |
| East | | | | | | |
| Bihar | 3I.I | 62.6 | 39.5 | 60.9 | 4.I | 2I.8 |
| Orissa | 22.7 | 53.3 | 25.2 | 48.2 | 3.6 | 2I.3 |
| West Bengal | 20.6 | 56.4 | U | U | U | U |
| North-east | | | | | | |
| Arunachal Pradesh | I4.5 | 39.7 | 27.9 | 53.9 | 3.6 | II.2 |
| Assam | I8.7 | 50.4 | 26.3 | 52.2 | I.7 | I0.8 |
| Manipur | 7.2 | 30.I | I6.0 | 33.6 | I.2 | 8.8 |
| Meghalaya | I7.2 | 45.5 | 38.4 | 50.8 | 4.8 | I9.9 |
| Mizoram | 5.3 | 28.I | I6.0 | 4I.3 | 0.6 | 9.2 |
| Nagaland | 7.6 | 28.7 | I3.2 | 32.4 | 2.3 | I2.7 |
| Tripura | I9.6 | 48.8 | 2I.3 | 46.0 | 0.7 | II.5 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| West | | | | | | |
| Goa | 8.9 | 35.0 | II.0 | 32.5 | 2.4 | I5.3 |
| Gujrat | I7.6 | 50.I | 25.3 | 48.2 | 5.7 | I8.9 |
| Maharashtra | 21.3 | 54.2 | 23.5 | 48.5 | 4.2 | 20.2 |
| South | | | | | | |
| Andhra Pradesh | I5.6 | 49.I | U | U | U | U |
| Karnataka | I9.4 | 54.3 | 22.7 | 47.6 | 2.6 | I7.4 |
| Kerala | 6.I | 28.5 | 9.0 | 27.4 | I.3 | II.6 |
| Tamil Nadu | I3.3 | 48.2 | U | U | U | U |

Note: Figures are for children born I-47 months prior to the survey. Each of the indices is expressed in standard deviation units(SD) from the median of the International Reference Population. The percentages of children who are more than three and more than two standard deviation units below the median of the International Reference Population(-3SD and-2SD) are shown according to selected characteristics.

U : Not available because children's height/length was not measured.

1 Also includes the children who are more than 3 standard deviations from the International Reference Population median.

SOURCE: National Family Health Survey,I992-93, International Institute for Population Sciences, Bombay,I995, P.286